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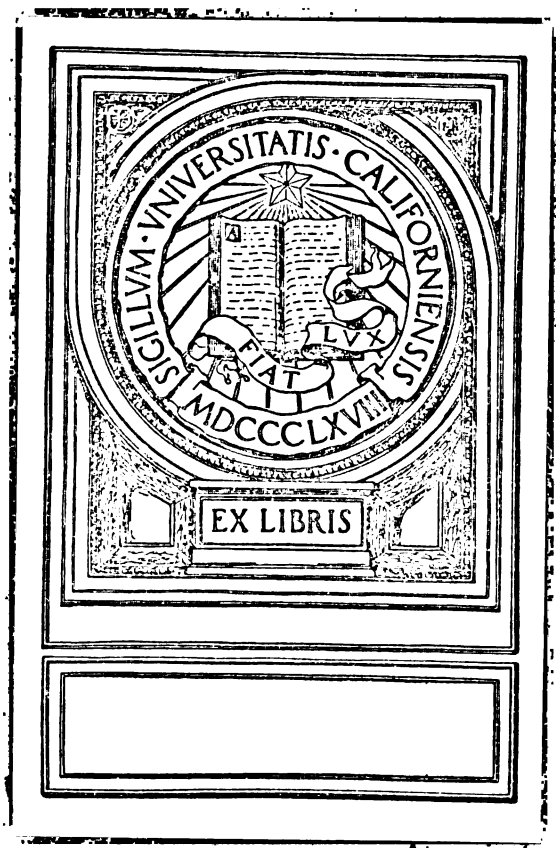
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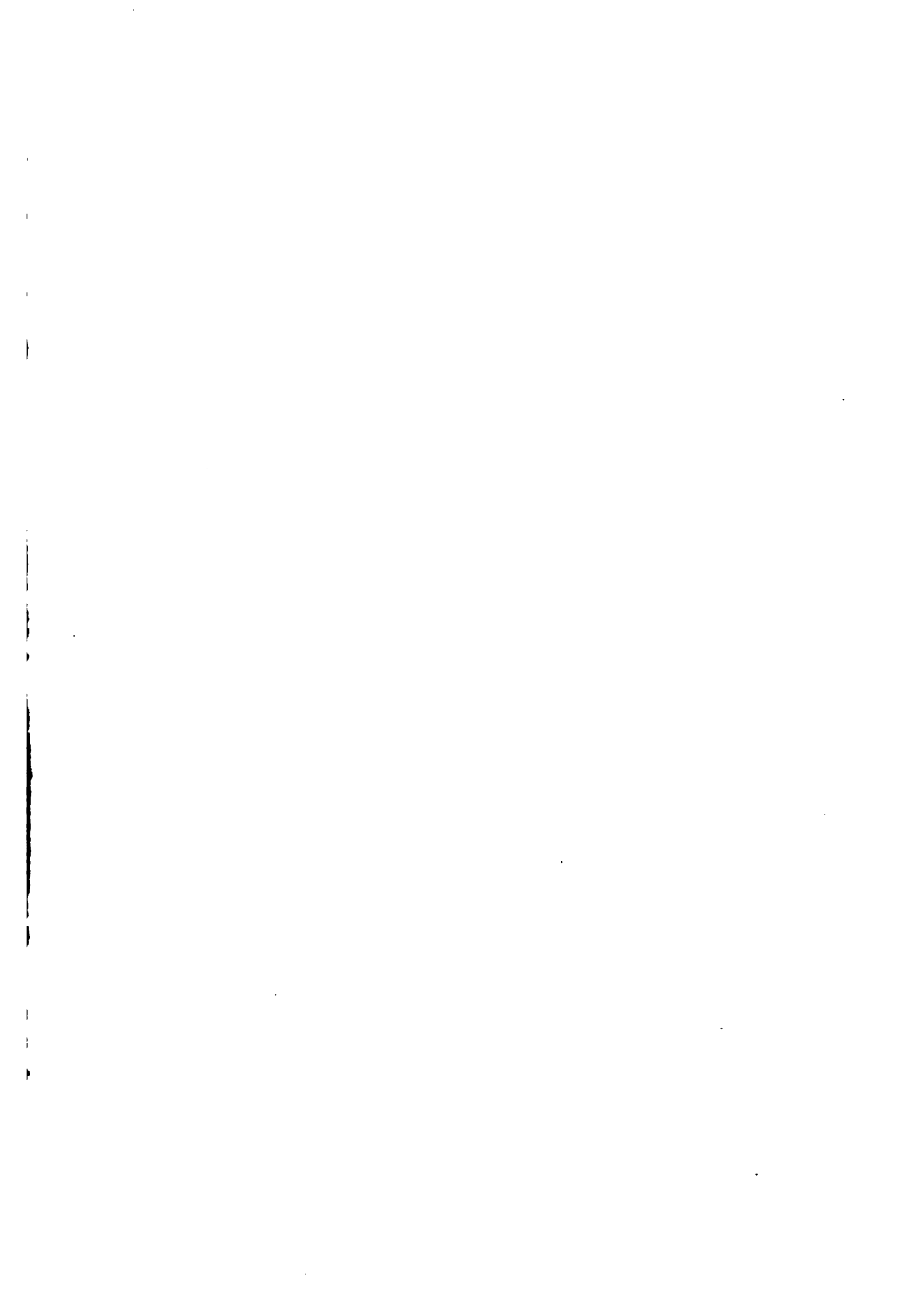
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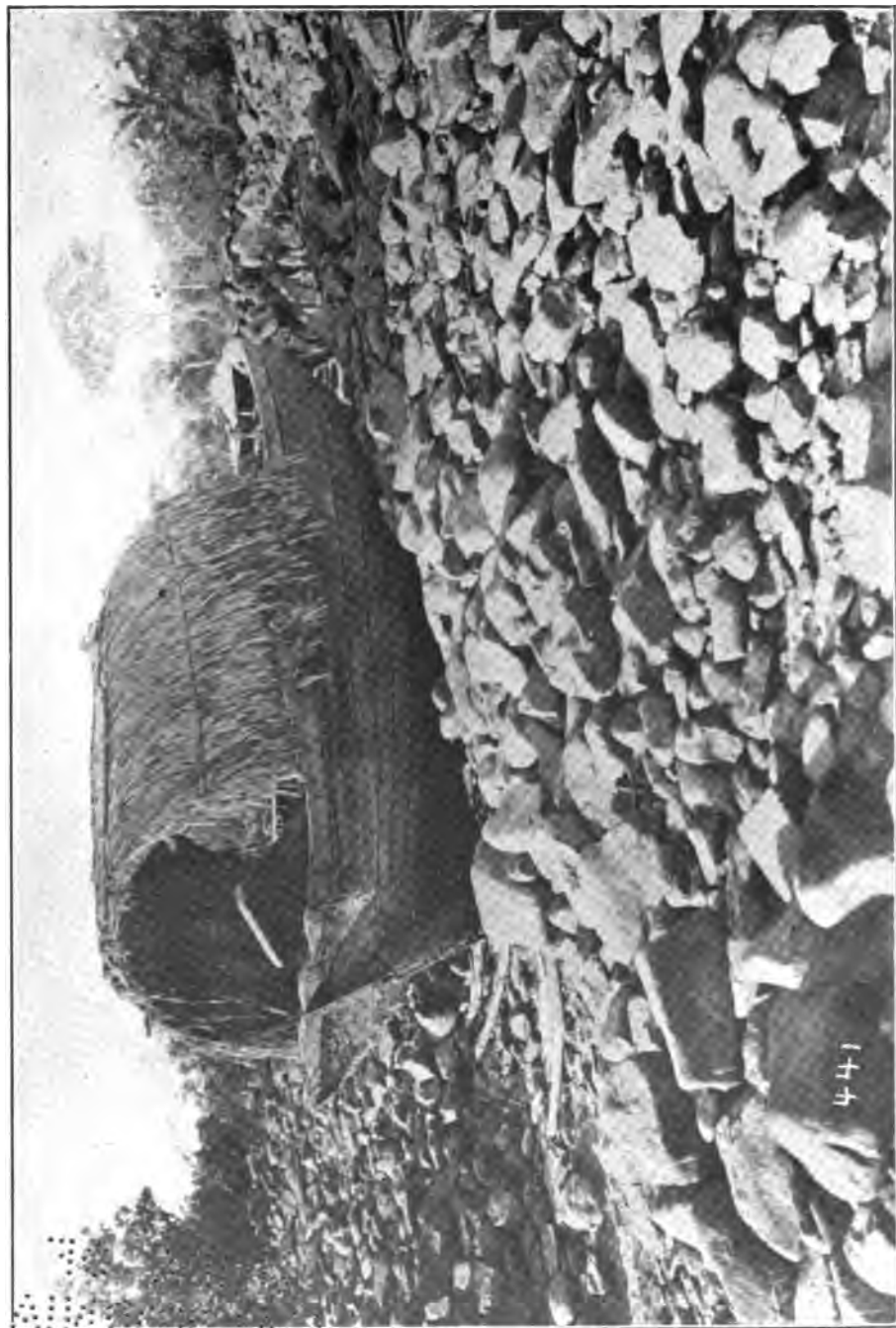






1944  
1945





HAULING RUBBER FOR RUBBER BOAT AROUND A CATARACT IN THE MADEIRA RIVER

# THE RUBBER COUNTRY OF THE AMAZON

A DETAILED DESCRIPTION OF THE GREAT RUBBER INDUSTRY OF THE AMAZON VALLEY, WHICH COMPRISES THE BRAZILIAN STATES OF PARÁ, AMAZONAS AND MATTO GROSSO, THE TERRITORY OF THE ACRE, THE MONTAÑA OF PERU AND BOLIVIA, AND THE SOUTHERN PORTIONS OF COLOMBIA AND VENEZUELA

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By  
HENRY C. PEARSON

Editor of "The India Rubber World." Author of "What I Saw  
In the Tropics," "Crude Rubber and Compound-  
ing Ingredients," Etc.

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NEW YORK  
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## PREFATORY

**I** THINK it was in 1870 that I started to outfit my first expedition to the Amazon. It was not in any sense scientific nor had I the interests of the rubber trade then at heart. It was to be a hunting and fishing trip solely, varied by occasional battles with Indians. A treacherous companion, to whom I incautiously confided some of the outfitting details, betrayed the trust to my mother. She confiscated my gun, an elder sister hid the ammunition, so I was compelled to abandon the attempt for a short time, (forty years in retrospect is not long). And what a satisfaction to feel that one's early ambitions are finally realized, at least in part.

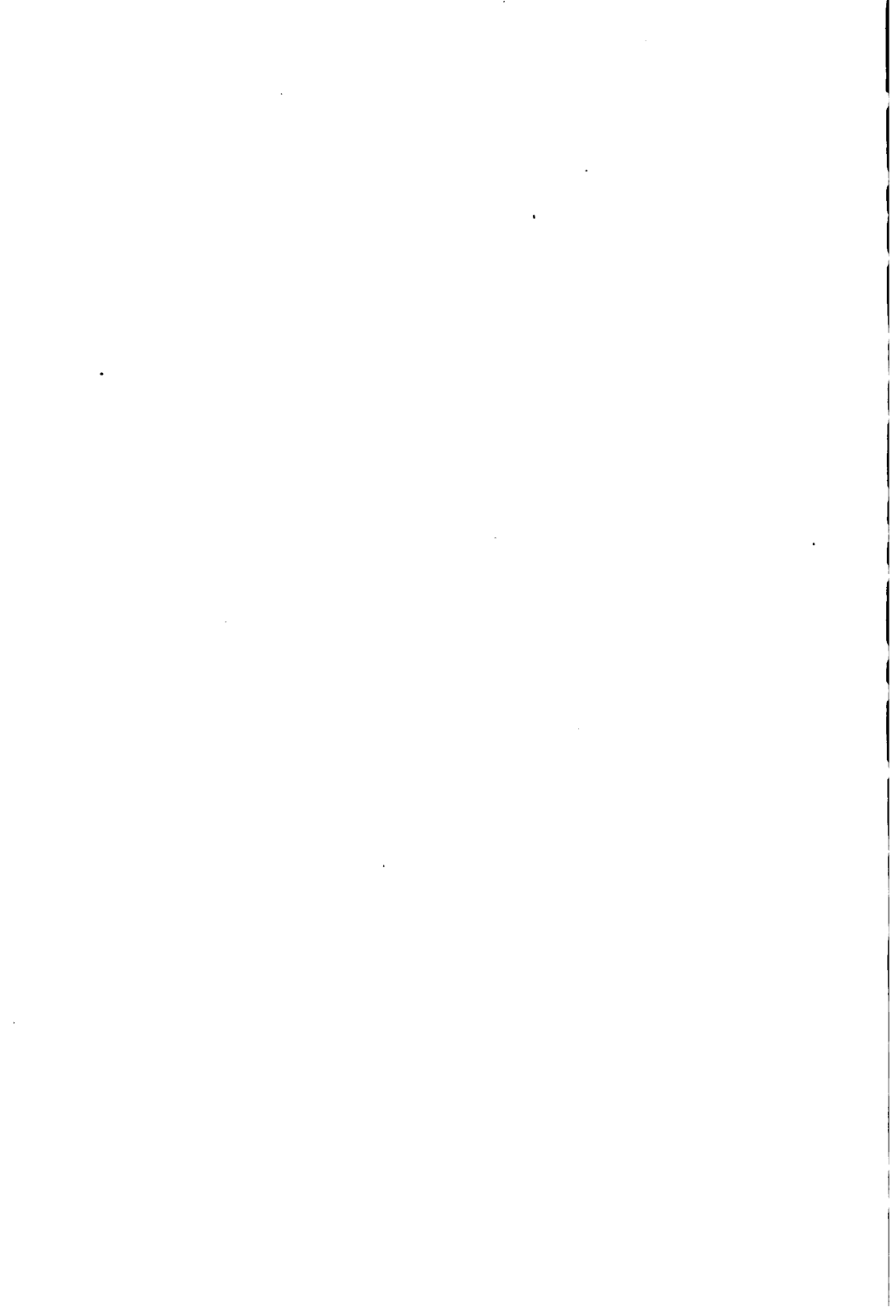
The delay in the journey altered my viewpoint somewhat, and changed the equipment. The gun, hunting knife, and lasso did not seem so important as a Letter of Credit; nor did I have that intense yearning for slaughter that dominated Expedition No. 1.

Then, too, much rubber research in other tropical countries made the prospect of this trip particularly alluring.

From the time when La Condamine made his report to the Royal Geographical Society at Paris upon the curious gum that he found in the Brazils, the Amazon river has been visited by a procession of specialists. Some went for adventure, some for trade and some in the interest of science. To such as Humboldt, Agassiz, and Spruce whose search was for knowledge the reward was the richest of all.

With one-half of the worlds product of india rubber coming from the mighty Amazon, with the great northern states of Brazil, and notable portions of Peru and Bolivia dependant wholly upon the rubber business it seemed time that the story of "Ouro Preto" (black gold as the Brazilians most appropriately call india rubber), be fully and fairly told.

Personally I am more than pleased that it is my fortune thus to tell the story. Not altogether my own experiences but a composite sketch, to which Governors of states, Captains of trading vessels, half breed rubber gatherers, American, English, German and Brazilian business men have all contributed.



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## CHAPTER I.

FROM BROOKLYN TO BARBADOS BY BANANA BOAT—THE HOME OF SEA ISLAND COTTON—SOME INTERESTING RUBBER PLANTING EXPERIMENTS.

I HAD been planning an Amazonian trip for several years, only waiting for the psychological period when everything would be ready for a really profitable visit. When, therefore, during the latter part of 1909, prominent Brazilians began to call at my office, full of interest in rubber planting and in new methods for collecting and coagulating rubber, I felt that the time had come, and made rapid preparations for the journey. The really luxurious traveler to the Amazon, if he be a New Yorker, goes to Europe first, and is able to make the whole passage on a big boat. It is a question, however, if he gets very much more of comfort than I got on the little 3,000 ton steamer of the Koninklijke West Indische Maatschappij, which sailed from Brooklyn, a well known suburb of New York, on the afternoon of January 3rd for Bridgetown, Barbados, West Indies; certainly he does not get as much Amazonian information en route.

It is a "Sabbath day's" journey from Manhattan by ferry and dock trolley to the Bush Terminal pier, from which the southern boats start. Ours was advertised to sail at 1 o'clock. The steamship office informed me in confidence that it got away at 2, my ticket read "Sailing at 3," and we really got away at 4.

Built in Amsterdam in 1908, commanded by Dutch officers, with Curaçoa negroes for a crew, and with only 13 passengers and a deck load of mules, the *tout ensemble* was unique, and the voyage gave promise of unusualness sure to appeal to one not wedded to luxury and the beaten track. Escorted by tugs and saluted by a mob of "dago" stevedores, we worked our way out through the press of tramp steamers, lighters, and foreign shipping, and our journey was begun. The sea was smooth and the tiny social hall and smoking room, bright with electric lights, were very cozy. The impress of Dutch art was upon both rooms, and showed in the inlaid tables, chairs, and walls, the Dutch-made rubber tiling of a pattern none but a Hollander could design, the upright piano of hard action and soft tone, in a queer, stiffly ornamented case built in the

side of the room, together with a fascinating panel painting of a mermaid in a tail-maid suit, sitting upon a rock, and alluring a low browed savage by blowing through a conch shell.

We had hoped for a smooth passage, and as we left New York right after the great Christmas storm, yearned for warmer weather, but it was not until the third day of the voyage that there was any



WIND MILL FOR CANE GRINDING, BARBADOS.

suggestion of either smoothness or warmth. A following wind from the northeast chilled the air and made the Gulf stream a steaming vapor crested caldron.

There were about the usual health seekers, in the persons of middle aged individuals, who were fleeing from winter rigors of the north to summer safety, an asphalt man and a drummer for a big textile house. There was little or no excitement, even when the friendly ones in the smoking room succeeded in introducing the potent and pleasant West Indian cocktail—the "Swizzle"—to the masculine contingent.

The usual route of the Dutch boats is outside of the West Indian

islands, Barbados being the first land sighted, but for the sake of smoother seas for his passengers the Captain took the inside route. We, therefore, late on Saturday night, saw Sombrero in the distance, and awoke Sunday morning off Sabre island, a brown sugarloaf peak rising from the ocean depths. Later came Dutch St. Eustacia, which we saluted. Then, running through white capped seas, we passed St. Kitts,



SQUEEZE ROLLS FOR CRUSHING SUGAR CANE.

Nevis, Barbuda, and Guadeloupe. All day long we skirted shores where the sea was a wonderful blue, where mountain peaks were wreathed in cloud, and the land, often heavily forested, showed the most wonderful varied, and vivid greens—colors that only a tropical sun and abundant moisture can create. That night, the last on board, we had a special dinner, with ornamented menu, and, as a *finale*, ice cream served in a huge block of ice, lighted by candles ingeniously arranged in crystal niches. At nightfall we passed outside again between Dominica and Martinique, and as it was squally the Captain spent the night on the bridge, while the rest of us slept.

In the morning we were close to the island of Barbados, which we partly circled, anchoring off Bridgetown at noon. A swarm of boats manned by husky black oarsmen crowded along by the ship's side, shouting anything and everything to attract attention to their boats. They had given genuine darky names to their craft, such as "Ladybird," "Lilywhite," "Mel Rose," etc. With all of our luggage in "Lilywhite," we went ashore, passed the courteous customs successfully, leaving my heavy service revolver in their care until I sailed again.



TYPICAL BARBADIAN NEGRO HUT.

and were soon bowling along the dazzling white coral roads to the hotel at Hastings. Here we had lunch, and three hours later, the luggage having arrived, were comfortably settled in cool, airy rooms, windows and doors wide open, clad in linen suits, wondering how cold it was on Broadway.

After all of the northern cold, and the boisterous and chilly sea, it was supremely comfortable to relax in the semi-tropical warmth and enjoy the evening stillness, broken only by the bird calls, the piping frogs, and the distant plaints of sheep and goats.

Rubber has not as yet been successfully grown in Barbados. There is, to be sure, a small planting of *Funtumia* on one of the estates, and a few *Ficus elasticas* in the gardens, but that is all. Not that the Imperial Commissioner and his associates are not on the watch for any rubber producer that may be of use. Indeed, their quiet alertness was fully proved when the "Ekanda" first came into brief prominence. They

secured some of the tubers, set them out, proved them useless, and turned to other work before the rest of the world was through with the preliminary discussion as to their probable value. Sugar is the great staple, and often produced in the old fashioned way by hand labor in planting and gathering, and often extracted by the wasteful windmill.

Something like 500 tons of Manjack or glance pitch is mined in Barbados. This form of asphalt is very solid and pure and is used in



GINNING SEA ISLAND COTTON, BARBADOS.

insulation quite largely. None of the small deposits that I saw were being worked, and the industry did not seem to be of great importance.

Of greater interest than sugar and molasses is the Sea Island cotton grown there. Barbados figures in the cotton trade possibly to a greater extent than some may be aware. While cotton was found native in the present area of the United States, there is no record of that variety ever having been put under cultivation. The cotton now grown in our country came from the West Indies. Just where is not certain, but it may be mentioned that the "sea island" sort, the *Gossypium Barbadense*, had its origin in Barbados.

For a long time the West Indian planters seemed not interested in cotton, but now, under the urgency of the British government that every colony shall be self supporting, if not more so, they are planting it and especially in Barbados. The amount of cotton produced is not large as yet, but considering the enterprise of the planters as a class, and the encouragement of planting interests by the governmental authorities, it seems reasonable to expect an important development from



FIELD OF SEA ISLAND COTTON, BARBADOS.

the present small beginnings. Already the annual production is nearly half a million pounds.

As a final touch to the subject came my visit to the Central Cotton Ginning Factory, located at Bridgetown. Here a very careful Scot somewhat reluctantly took us over the factory. That is, he was doubtful at first, but after a bit warmed up and showed everything with enthusiasm. The work of ginning, cleaning the seed, baling the lint, crushing the seed, expressing and clarifying the oil, and grinding the cake, was well done throughout. The machinery used was mostly English, with some American for special purposes.

## CHAPTER II.

EXPLORING THE ISLAND IN A FOUR WHEELER—SEAS OF SUGAR CANE AND SENTINEL WINDMILLS—BARBADOS AS A HALFWAY HOUSE WHERE ONE GOES INTO TRAINING FOR TROPICAL ADVENTURE—A TYPICAL TROPICAL GOLF COURSE—BOARDING THE RUBBER BOAT FOR BELEM.

JUST to get an idea of the topography of the island, we rose early one morning and drove over to Codrington College, some 14 miles away. The roads were all good, but narrow, with no sidewalks even in the small towns. It was a wonder, so smooth were the roads, that the 40 automobiles owned on the island, as well as the 1,500 bicycles, were not equipped with solid tires rather than pneumatics. There were no speed limits, but there were so many turns, and such a crowd of foot passengers and vehicles, that more than 20 miles an hour was out of the question. So smooth were the roads that boys with forked sticks rolled three-inch iron wheels for miles—a form of toy not seen elsewhere.

The drive was a very beautiful one, through great fields of sugar cane, by big and little sugar mills, sometimes run by steam power, but more often by the wind. We stopped briefly at St. John's church, which is situated on the top of a hill fronting the ocean, and climbing the bell tower got a wonderful view of sea and shore. Then we wandered through the ancient churchyard and looked at the quaint headstones and limestone vaults, took photographs and went on our way.

A four-mile drive down a series of steep hills, where the driver roped one of the rear wheels to keep it from turning, and we were at Codrington College, which we did not see much of, as the main buildings were being repaired. Here under a huge tree, from the shade of which we evicted several sullenly reluctant toads, we opened our lunch basket. We were very comfortable, for the caretaker brought us chairs, and a "monkey" of cool water, and the food was excellent. We loafed and smoked through the heat of the day and finally, at 3.30 started back. On the way we stopped at a sugar estate and saw a windmill at work and the process of boiling the juice. The proprietor was an absentee, but his colored



superintendent was elaborately polite and hospitable. After the examination of the plant he led us to the "gallery" (veranda) of the house and treated us to a pitcher of the hot syrup.

The day following I called upon the American Consul, who promptly put me up at the Golf Club, and was particularly helpful. Speaking of golf, I had been advised that it was well before a journey to the Amazon to get in as good a physical condition as possible. That was one reason



AVENUE OF ROYAL PALMS, BRIDGETOWN.

that I was glad to be put up at the Savannah Club which institution merits a little extra attention, as the links were different from any that I had ever played over.

There is a station half way between Bridgetown and Hastings known as Garrison. Here are arranged on three sides of the Savannah the brick barracks and officers' houses that once sheltered full regiments. To-day there is hardly a corporal's guard left. One of the buildings, the 'clock tower,' where the regimental bands played, had been acquired by the Savannah Club, that in the face of a dearth of men has kept tennis,

cricket, and polo alive, and incidently laid out a six-hole golf course. The putting greens, circles of 23 feet, cut into the thick bunch grass of the fields, were fine. Seeded to Bermuda grass, they are always level, free from worm casts, and as nearly perfect as possible. Then, too, the course to the first hole, across the polo field, was such that one can



CODRINGTON COLLEGE, BARBADOS.

use a brassy, but nowhere else. All of the tees were built on a slant and grassed because of the rains, and it was wonderful how far into the sky one could drive a ball. The caddies, funny little darkies, went on ahead and located the ball in the deep grass, and thereafter one used a loftier. By the club rules if a caddy fails to find the ball, any other boy who does gets threepence, to be deducted from the caddy's fee. Very few balls are lost. Although it is hot there is usually a breeze, and eighteen holes with tea afterward on the club "gallery" is a good healthy afternoon's work, and pleasant finish.

Did I by any chance say there were no bunkers on the golf course? I was wrong. From one tee the drive was over the race course and a high board fence. Then, too, there were the big banyan trees that circled one green. The only play was to loft the ball up over the one fronting you. Then the small movable bunkers, the tethered cows, sheep, and goats, might all be called hazards. One cow in particular lowered her head and charged golfers whenever they indulged in too much preliminary wrist wriggling. I did not blame her. If I had her horns and bulk, I'd try to break up the practice myself. The goats chewed the balls some, but that was only because they were thirsty and hoped that some of the Americans were using watercore balls. Oh, yes, there was much of interest and sport, particularly when a sergeant was drilling the awkward squad on horseback on the polo field and you were at the first tee. It was a poor drive that didn't get a horse or a man, and the sergeant never knew what broke the formation. Then at the last hole when you sliced on the approach and cannoned on a carom—no, caromed on a—well, hit one of the row of cannon, it only threw you off a bit, and added to the zest. So I kept it up between whiles, and awaited the boat that was to take me to Pará.

The owner of the hotel was very much of a genius in making his guests comfortable and, incidently, amusing them. Aside from dancing and bridge for those so inclined, as he was not saddened or disgusted if you had other preferences, he had a series of tallyho rides that were unique. With good horses, and the only coach on the island, he was a whip who would be accounted an expert anywhere. To be conveyed over the slippery limestone roads on Saturday night, down through the indescribably crowded streets, cutting close corners, around the market and out under the low stone arch set in a very inconvenient curve, through "Murderer's Lane" and home, was a delightful experience and not without thrills. Then, too, there were his special excursions in the afternoon to the "haunted wood," the "baboon village" and the "smuggler's cave," places not noted in the guide books, but full of fun and interest.

I saw sights and wrote forenoons, and golfed at 3.30 each day, and, by the time my boat arrived, was feeling very fit. Indeed, I should advise any one coming in midwinter from the north to stop at Barbados and get accustomed to warmer weather, and incidently rested and refreshed before essaying the heat.

Barbados is the health resort of those who find the climate of

South America too much for them. That is why I have given it so much space, and why also I add the following personal conclusions:

Barbados is the oasis in the watery waste between New York and Pará where all wise travelers stop for rest and refreshment.

No bother at all with customs. They only tax tobacco and spirits.



MANJACK MINE, BARBADOS.

Everybody speaks English. The 200,000 residents are negroes, but at the same time British subjects. Two or three weeks' study renders their English quite intelligible.

Clothing is as good and as cheap as anywhere in the world. Just the place to buy for a journey up the Amazon. No, it did not fit.

George Washington, our own George, came down here when a young man, and the governor hospitably gave him an elaborate breakfast and—the small pox.

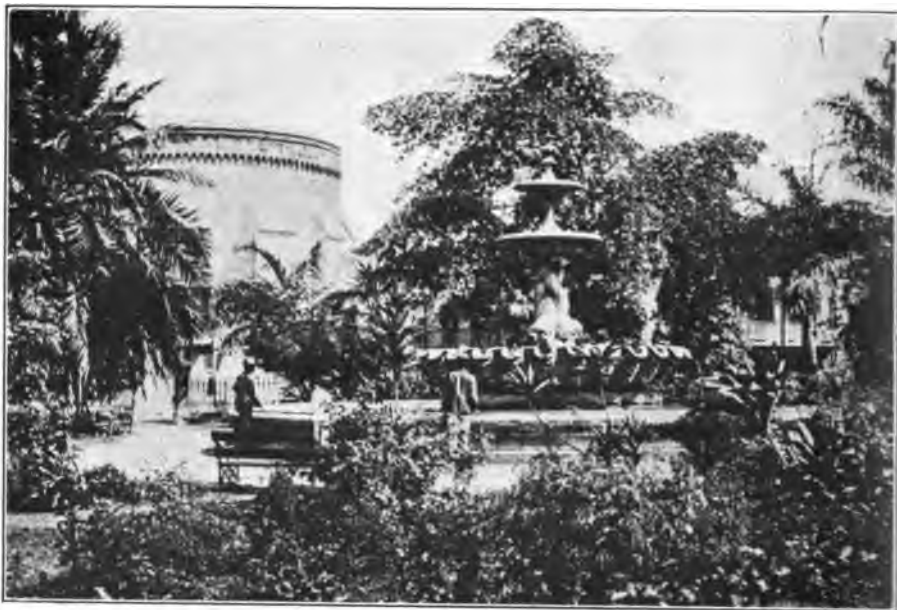
Gentle showers almost every day. Good water. No fleas, few flies, and fewer mosquitoes.

Bathing ideal, but beaches are few and guarded by coral reefs that are like the broken glass on the top of an orchard wall.

Living reasonable, labor plentiful, cheap, and profoundly inefficient.

Barbados is unique among the islands that crowd the southern seas, in that it is dry, comparatively level, has no forests, is of coral formation, and is said to be almost as healthy as Heaven.

It was 6 in the morning of a Sunday when the welcome information came that our boat was in. So we got up hurriedly, finished packing and went down stairs, fearful that we would not have time for breakfast, for it was said that her stay would be only two or three hours at most.



PUBLIC GARDENS, BRIDGETOWN, BARBADOS.

Somebody had blundered, however. It was not ours, but one *from* Manaós and Pará, and soon a number of bright young American engineers from the Madeira-Mamoré railroad came in. After a year in the jungle they were glad of a vacation and were friendly, jolly and apparently as healthy as if they had been at work on the New York Central. We waited until 2 p. m. and at last our boat did arrive, and at 3 o'clock we started for the pier. We had to hurry but managed to call at the postoffice and extract a letter from a languid clerk after answering innumerable questions. Then I went to the custom house and secured my revolver, and, boarding a shore boat, we got to the ship's side at ex-

actly ten minutes of 4. A pretty close shave for she was to sail at 4 *sharp*.

We hastened to get our luggage stowed, fortunately exchanging our cabin on the saloon deck for one on the upper with more room and better air. Then we went out and took a last long look at the beautiful island that had been our resting place for thirteen happy days!

Having looked this look, we threw coppers to the diving boys, chatted with the harbor police, and went in and smoked. At 5 o'clock we came out and took a last long look at the beautiful island that had been our resting place for thirteen happy days!

Then we went to the cabin, rearranged our baggage, put on rubber soled shoes, smoked a pipe, and at 6 o'clock went out on deck and took a last long look at the island that had been our resting place for thirteen happy days!

At 6.30 the agent came aboard, then three boats filled with females and luggage—two females and several tons of luggage. The females were dusky of hue, and the luggage was done up in wicker baskets, bed quilts, and paper boxes. Finally the side ladder was up, the anchor weighed, and we went on deck to take a last long look at the island that had been our resting place for thirteen happy days!

We had dinner that night in a cozy little saloon decorated with a variety of foreign flags, to please no doubt the somewhat varied assortment of humans who fronted the viands. There were Barbadians, Brazilians, Peruvians, Mexicans, Swiss, Germans, English, and Americans, the last named an interesting lot of engineers returning for a fresh attack upon the jungle for the Madeira-Mamoré railroad.

The smoking room crowd told weird tales of fevers, sicknesses, and deaths, all of which we discounted, for were they not going back, and was not the ship's doctor, a quiet, healthy man, going up the river for his thirtieth visit? Still the stories were entrancing, especially when they described that mysterious beriberi that begins in the legs, works up to the heart, and ends in the burying ground.

The third day out I awoke with a feeling of numbness in my legs. When I walked the deck it was quite painful. Remembering the vivid descriptions of beriberi that I had heard from convalescents in the smoking room the night before, the absence of fever, the way it affects the legs, and so on, I began to think. Nor was I at all reassured when the ship's doctor halted beside me as I leaned over the rail, and looking at me keenly said:

"How do your legs feel?"

"Oh, so so," I said truthfully—for they did, only the left felt more so than the right.

"Humph! Thought perhaps the combination of hot decks and rubber-soled shoes might have lamed you a bit. It does most people," he answered, and my depression vanished.

Outside of the boat, her officers, and passengers, there was only the monotony of the bounding billow. No gulls, whales, sharks, or sails. Even Halley's comet, which should have been visible each night, was regularly obscured by clouds. And as for sunsets we didn't have a real



CONSTABLE OF THE GOLF COURSE, BARBADOS.

one on the whole voyage. One evening three of the little Peruvian girls played a trio on the piano; while the others danced a graceful *fandango*. Between whiles there was talk of Neptune coming aboard, and those who had never crossed the Equator got very nervous and asked innumerable questions.

I think it was at dinner that the Peevish Passenger who had only just been able to crawl down to the table, catching a twinkle in the Captain's eye, groaned:

"Here comes the whiskey joke."

"I'm a sailor twenty-six years an' I say water's a fine thing—with a drop of whiskey in it," announced the Captain. (Much applause).

Another twinkle of the same eyes.

"It's eggs this time," whispered the P. P.

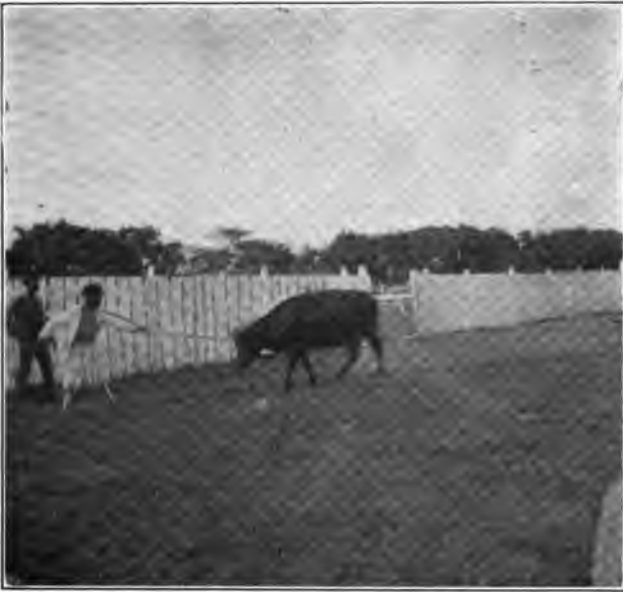
"If I 'ad my life to live hover again I wouldn't go on as much water as would boil two heggs," said the Captain. (More applause).

Suddenly the Peevish Passenger arose.

"I'm sick," he said, looking at the humorist.

"Wot of?" inquired the Captain

"Of them eggs. This is the tenth v'y'ge you've served 'em up, and they're gettin stale," and he stalked unsteadily out.



AN AGGRESSIVE BOVINE BUNKER, ON THE GOLF COURSE, BARBADOS.

All through the voyage every one who knew enough took quinine, loafed, read, and kept generally quiet. Indeed, although the sea was not unusually rough, the boat rolled so constantly that the best sailors among the passengers frankly acknowledged their discomfort. It was not so much the fault of the boat; it was the cross seas stirred up by the steadily blowing trade winds that did the mischief, and we were thankful when the light off Salinas (on the Brazilian coast) was sighted and we picked up a pilot for the hundred-mile run up the river Tocantins to the city of Pará—or Belem—the last lap of the journey down the Atlantic.



## CHAPTER III.

ENTERING THE TOCANTINS, THE NECK OF THE AMAZONIAN RUBBER BOTTLE—  
REAL EQUATORIAL RAINS AND HEAT—THE 100-MILE RUN TO THE CITY OF PARA—  
THE LONGEST WAY ROUND, THE SHORTEST WAY TO THE SHORE—LANDING IN THE  
MIDST OF RUBBER.

OUR craft was first and last a rubber boat and had carried millions of dollars' worth of fine Pará to the States and to Europe—\$4,000,000 in one cargo. Almost from the beginning the Captain and officers talked rubber. They spoke with pride of Riker's plantation up at Santarem, and said he had 50,000 trees and was already tapping. Posted in the chart room was the following:

### "SHIPMENTS OF RUBBER IN MANAÓS, PARA AND OTHER PORTS.

#### *Special Notice to Captains and Officers.*

"We desire to call the special attention of our captains and officers to the fact that for some time past rubber cargoes have come forward with the weights in kilos incorrectly marked on many of the cases, the result being that whenever these cases are landed here broken, the vessel is invariably called upon for the deficiency between the foreign and the English weight.

"We, therefore, insist upon the utmost care being taken in receiving and stowing this description of cargo, so that the cases stand no possible chance of being broken, and that a thorough search for loose rubber be made in all lighters before being taken away from vessel.

"It is also important that very special attention be given to ports of destination on cases of rubber for Havre, and that shipments of *pelles* and other loose rubber belonging to various consignees be entirely separate; different holds preferred. Great care must be taken in the storage of nuts and Lisbon cargo, that the immediate discharge of rubber in Havre and Liverpool be not interfered with. This is very important."



RUBBER LIGHTERS AND FRONTAGE OF THE CITY OF PARA.

We had been in the mouth of the Amazon for certainly twelve hours, and the yellow waves gave no suggestion of saltiness. We told each other the ancient tale of the boat's crew perishing from thirst, hailing a passing vessel and begging for water, and getting the well-known reply, "Dip it up then; you're in the mouth of the Amazon." We never realized what a mean trick was played on those thirsty mariners until we got a deckhand to dip up some water. It was exceedingly brackish and far from drinkable.

At nightfall it began to rain in torrents and we felt our way up to the pilot boat, which lay rolling in the trough of the sea in a manner that suggested discomfort to those on board. After a time a boat put off from her side and we saw it jerkily advancing over the waves to meet us. That is, we didn't see the boat—it was too dark for that; we saw the gleam of a lantern at intervals when it rode on the crest of a wave. The pilot, a huge Indian, caught the side ladder and climbed aboard with surprising agility.

After about half an hour

steadily steaming, through sheets of rain illumined by occasional lighting flashes, with the lead going constantly, we anchored in 15 fathoms of water to wait for daylight before proceeding up the river. At 5 o'clock the next morning we started on again, and soon it was light. The yellowish green water had taken on a deeper yellow and the morning was a mixture of rain squalls and short intervals of sunshine. The Tocantins looked like one of our own great lakes after a storm. In all directions were floating forest wreckage and marsh grasses, and in the far distance the low lying coastline.



NATIVE FISHING BOAT, TOCANTINS RIVER.

Soon we began to see the fishing boats of typical Portuguese construction, fitted with sails, dark brown, red and blue. As we got further up the river the water became calmer. Did I mention that it was growing warmer all of the time? It certainly was hot, and those who were to remain on board the boat during its stay in port were already getting out mosquito bars. The captain explained to me the reason for anchoring the night before. It seems this coast is afflicted with unusual and strong currents. He pointed out a bank which a huge freight

steamer skirted by unlucky chance one dark night, running her bilge keel upon it, and turned turtle almost instantly. Then, too, he showed us the reefs where only a short time before another huge freighter had been wrecked, the captain blowing out his brains when he found his vessel was a total loss. Soon we sighted some of the many islands with which the waterway is filled, and then almost at once got our first glimpse of the water front of the great Rubber City.

In coming up to Pará everything is on so large a scale that one



BUSINESS STREET, PARÁ.

gets no idea at all of the wonderful configuration of the country. The view is confined to wide expanses of muddy water, low shores, densely overgrown with tropical forests, and a few islands. A bird's eye view would show islands big and little by the thousands, rivers of all sizes coming in from every point of the compass, almost; creeks, lagoons, waterways, the whole lower country a gigantic plain rising but a few feet above tide level, sparsely settled, the riot of vegetation crowding

every inch of space, and even stretching far out into the quiet earth-laden waters.

We passed in safety the little Portuguese built fort that guards the entrance to the harbor, skirted the shore where the great plant of the Port of Pará\* is located, and finally dropped anchor about a mile from the piers. When the great tropical contractors finish their work, Pará will have a fine system of granite quays, at which steamers may discharge and load, and passengers go ashore over a gangplank. Until that is done, cargoes are handled in huge lighters covered with movable



RUBBER WAREHOUSE, PARÁ.

sheet iron awnings, and passengers go ashore in launches, tugs or rowboats.

I had heard many stories of the vigilance of the customs officials, and that everything paid duty. I, therefore, took only hand baggage for the first trip ashore, and even then would have had trouble with the camera had not a smoking room friend explained in profuse Portuguese that I was intimately connected with the *Intendente* (mayor) and had

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\*The American corporation improving the harbor.

come from New York purposely to get his photograph. Both federal and state customs, who were aboard almost as soon as the anchor was down, passed me at that. They don't take any chances, however; a passenger going ashore even for a few minutes cannot return to his boat without a permit from a shore official, and luggage may remain in the custom house until the Amazon freezes over, if the officials do not choose to bestir themselves. At least so everybody says. To finish my own custom house experience, a newspaper friend went next day,



TYPICAL RUBBER OFFICES, PARA.

picked out my luggage, got it passed and up to the hotel within two hours. He did this by reading again and again to the board official a personal estimate of the writer that he himself had caused to be put in the daily papers. In self defense the customs man marked the luggage.

The shore tug on which we embarked took us within a hundred yards of the shore and then tied up to one of the huge lighters, where we were to be transferred to a small rowboat. We saw a couple of porters jump on the lighter, walk around its shelflike edge, and disappear

on their way to shore. Rather than wait for the boat, I followed and wished I hadn't, for the other side of the lighter was made fast to what was once a long wooden pier, but the planking having all been removed there remained an uneven, rotting nailstudded skeleton with the yellow water looking surprisingly dirty and deep beneath it. I got ashore all right, but the broiling sun and my exertions put me in a perspiration that would fill a Turkish bath attendant with envy.

We landed right in the rubber district. There was rubber everywhere, on the sidewalks, in the streets, on trucks, in the great storehouses and in the air—that is, the smell of it. We didn't pause to see the rubber men then, however, but went up a narrow street to the electric car line, swung aboard, and were soon at the Café da Paz and located in comfortable rooms.

Breakfast is 12 o'clock noon, in Pará, and while I was enjoying the meal, I took occasion to chat with an American commercial traveler who came to Brazil once a year. It makes me proud to see evidences of American enterprise in foreign countries, so I asked him a few questions.

"Do many commercial travelers visit this port?"

"Lots of them," said he.

"How many American drummers are there in town at present?"

"I'm the only one," was the reply.

"How many Germans are here?"

"Eighty," said he.

## CHAPTER IV.

PARA A PLEASANT SURPRISE—HOW THE "WHITE WINGS" WORK IN PARA—THE YELLOW FEVER MOSQUITO AND HOW TO DODGE IT—A MILITARY FIRE DEPARTMENT—BITS OF EARLY HISTORY.

I MUST confess that I was agreeably disappointed in Pará. The steamer gossips had said much about the city, and little that was good. I paid 12 *milreis* a day at the hotel and found both service and food excellent. The gold *milreis*, the standard of the Brazilian monetary system, is equal to 54.6 cents in United States money. Business, however, is conducted mainly on a paper money basis, with the price of the *milreis* varying with the rate of London exchange, which averages a little over 15 pence, or 30 to 31 cents.

My bedroom, with its lofty bare walls, 12-foot double casement, and narrow bed with mosquito net draped over a white parasol and hanging in graceful folds to the floor, was just my idea of a tropical apartment. To be sure, if one lighted a lamp and put it in the open casement at night, it was possible to coax mosquitos in. Some visitors do this and then kick. I did not. I had my cheerful little brown chamber man look through the net in mid afternoon for mosquitos, then tuck it securely under the mattress, and what few bites I got did no harm.

As long as we are talking about mosquitos, there are two kinds that work mischief—the little black ones that carry malaria, and the larger striped ones that may or may not provide yellow fever. We recognized both kinds and they recognized us, but nothing came of it.

The day of my arrival a Portuguese physician, who was a friend of mine in Rio, called and left a packet of powders with directions to "take one every morning," and I would not have yellow fever. His medicine was all right. I took it three days and escaped; then somebody stole the box and so I couldn't experiment further. Speaking of yellow fever, it would be foolish for any one to disregard ordinary precautions. But to my mind the pneumonia of our Northern clime is much more easy to get and just about as fatal. Yellow fever is endemic in Pará. There were several deaths a week while I was there, but it was a question if they



were all yellow fever. Most of those who died from it were from the lowest classes, who weaken their stomachs by drinking *cachaca* and then get what may be a low malarial fever or almost any kind of bilious fever; it all goes down as *amarello*.

The city itself is exceedingly beautiful. Near the water front it develops some smells other than those produced by rubber, but up in the city proper it is fine and clean. The cafés, with tiny round tables out on the sidewalks, remind one very much of Paris. In the residence section—for example, the *Avenida Nazareth*—the elegant homes, luxuriant tropical gardens, the well-paved streets, and the shaded sidewalks are worth coming a long distance to see. Before daylight every morning, an army of



THE AVENIDA REPUBLICA, PARA.  
(At the right is shown the Hotel da Paz).

laborers sweeps every city street, using broad palm branches, one of which does the work of a dozen brooms. The litter is then carted away in huge covered tip carts, each drawn by a single well-fed, patient-eyed steer. Then in the afternoon the heavy showers come and help notably in this street cleaning. The city in many respects is very modern. Automobiles are there in plenty, and as there are no speed limits, the drivers scorch up and down any and all streets at 35 to 40 miles an hour, but with no accidents as far as I could observe.

The police service is excellent, and one cannot go anywhere after dark without seeing a policeman at almost every corner.

The parks both in the city proper and beyond the city limits, as well as the magnificent Botanical Gardens, are beautiful beyond compare.

It is, to be sure, a tropical city; that is, it has its hours of relaxation every day, and its days almost every week. Certain of the offices, for example, open at 9 in the morning, close between 11 and 1, and close again at 3. They also keep the bars up Sunday and feast days, which latter are many. While the lesser officials watch the clock and kill time, the



PRACA DA INDEPENDENCIA, PARA.

*Intendente* works day and night, so 'tis said, and it is to his energy and foresight that many of the beautiful buildings and parks, as well as public utilities, are due.

There is an excellent fire department, with the best tropical equipment I have seen. Accustomed to the freedom of American cities, I started to walk into one of the central stations one day to look it over, and was promptly held up by a businesslike young chap with a Mauser rifle, who called for the Corporal, who reported to the Captain, who in turn got



SALON IN THEATRO DA PAZ, PARA.

the *Commandante*. He very politely detailed an officer to show me through the yards, stables, gymnasium, dormitories, and munition room, and to examine the engines, hose carts and ladder trucks. It was the first combination of barracks and engine house that I had seen, and I was much interested, and said so to the *Commandante*, the Captain and the Corporal,



PUBLIC LIBRARY, PARA.

each of whom saluted politely with outstretched hand and raised hat as I left. To the sentinel I gave a big black cigar with a gorgeous band on it, and underneath the band a revenue stamp, which every cigar in the Brazils is obliged to wear.

Pará is a very old city and was actually founded four years before the New England Pilgrims set foot on Plymouth Rock. The founder was a fighting Portuguese named Francisco Branco who drove out the French, who had no right there. For twenty-five years, or until 1641, the state of Pará was part of the province of Maranhão but in that year it became independent. Then the Dutch took possession of the city but



CITY HOSPITAL, PARÁ.

after a time got weary and abandoned it. In 1641 there was a strong company formed in Portugal called the General Commercial Company of Brazil. It had a monopoly on Amazonian commerce, its only duty to the home government, besides making money for it and for themselves, being to keep other trading vessels out of the waterway. It kept 31 armed ships in commission for this and was in full control for 70 years.

The commerce had grown so that in 1700 Pará afforded the best market in all of the Brazils, shipping great quantities of cacao, vanilla and indigo, and raising some coffee. Cattle raising was also introduced on a large scale on the island of Marajo. In 1741 La Contamine visited

Pará, sent out by the French Royal Geographical Society, to discover the real shape of the earth. That he did not decide it was flat after seeing the lay of the land in that part of the world speaks much for his perspicacity. He has also gone down into history as the first scientist to report upon india-rubber. The good father, familiar with the metal piston syringes used in Europe, was amazed and delighted with the rubber syringes made by the Omagua Indians. He was also further amazed



FIRE DEPARTMENT ON PARADE IN FRONT OF THEIR BARRACKS, PARÁ.

when he discovered that an Indian chieftain giving a banquet, presented a syringe to each guest for use before eating.

Up to 1741 the state of Pará reached inland as far as it chose but in that year the great state of Amazonas was created, and definite borders given to each.

When in 1822 Brazil separated itself from Portugal, Pará did not approve, and the government at Rio sent a warship up to reason with them. Its mere presence quieted things down and there was no blood

shed. Thereafter, however, there was a strong republican sentiment in the city and state and in 1889 when the Republic was declared, the people of Pará welcomed it gladly.

The city of Pará at the present time has a population of about 100,000 people. It is on gently undulating ground rising very gradually from the river front. There are no real hills in the city proper or near it. Deep natural ditches called *igarapes*, "canoe paths," run far inland from the river, many of them containing water enough to float canoes, and small boats. The tide rises and falls regularly in these natural waterways sometimes for miles from the river. Not only the mainland but the islands have hundreds of these natural water paths that afford access to the interior where road making would be difficult.

## CHAPTER V.

RECEIVED BY THE GOVERNOR AND "INTENDENTE"—CLUB LIFE ON THE AMAZON—  
CARNIVAL SCENES—BRAZILIAN HOSPITALITY—HAMBURGER TOURISTS.

A FRIEND had suggested, almost as soon as I landed, the advisability of visiting the Governor and, when I agreed, promptly arranged for an audience. But I was in flannels and my frock coat had been carried off, I knew not whither, to be pressed. The Yankee Consul, however, stepped into the breach and communicating to the Governor my predicament, the audience was set for the day following. To learn all of the details, I meandered over to the consulate, where the Consul greeted me like a long-lost brother. If I had come from Ohio, his native State, I believe he would have embraced me. A husky, warm-hearted, quick-tempered, bustling Westerner, he won my heart then and there, and when he came around next morning in a taxicab with a visiting rubber manufacturer from the States and a leading Brazilian rubber merchant, I was glad I was ready.

A frock coat and a top hat are not the most comfortable things in the tropics, but we all wore them. And as the other three were stout and I am not, my collar didn't wilt until the audience was over, which is more than they can say for themselves. The Governor received us on a sort of divan flanked by four chairs, which we occupied. We talked about rubber planting, in which he is very much interested, and he said that the State was willing to do anything in reason to encourage planting corporations.

"My friend on the right is one of the largest manufacturers of rubber in the world. He uses only Pará rubber, and his factory is in Ohier," remarked the Yankee Consul.

If he had said "Erhio" or "Oheeo," I think the Governor would have understood that he was referring to the Mother of Presidents. But as it was he only looked blank and murmured a compliment, while the Visiting Manufacturer's eyes twinkled as he thought of his last year's bill for re-claimed rubber.

It is difficult for a democratic American to know how to address high foreign officials. The Visiting Manufacturer called the Governor "Mon-

sieur, the Signor," which sounded well. I didn't catch the Portuguese rendering of the title, but turned into English it reads "Mister the Mister," which, although respectful, is slightly tautological.

It was'nt really a heart-to-heart talk as the Governor knew no English and we knew no Portuguese, and I think his Excellency was glad when it was all over. Not that he showed it in any way. He was every moment the courteous, polished dignified gentleman, and the next day sent his *aide de camp* around to my hotel to return the call, and, before I left



TYPICAL CITY STREET, PARA.

the city, sent me a score of beautifully illustrated books and some marvelous maps for souvenirs of my visit. His word also placed everything in the beautiful public library at my disposal.

We also made a formal call on the *Intendente*. According to his enemies, he is another Richard Croker. He received us at 8 o'clock in the morning at his home, a fine big palace of a house, with broad verandas and magnificent apartments opening one into the other. He had with him the secretary of the municipality, a huge, intellectual, coal-black negro, who is probably the finest orator in Northern Brazil, and is



called the "Booker Washington of South America." I asked the *Intendente* why, instead of shading the streets of the city with mango trees, he had not planted rubber trees? He answered promptly that years ago there was much tuberculosis in the city; that the mango gives off an aromatic balsam that is very healing, and that consumption had practically disappeared since the trees had matured. Besides, the poor people practically lived upon the fruit of the tree for weeks at a time.

The Visiting Manufacturer, who evidently had been picking out the wrong cabs, said to the *Intendente*:

"Why don't you fine cab drivers who do not use rubber tires?"

The reply came:

"I have done better than that; I have taken the tax off of rubber



PROPOSED NEW MUNICIPAL BUILDING, PARÁ.

tired vehicles and kept it on steel shod ones. Now it's up to you to make better tires so that our drivers will all be able to use them."

After that we retired, the *Intendente* wearing the honors.

Pará has a number of daily newspapers. Two of them, however, are leaders. One is owned by the *Intendente*, who edits it vigorously and wisely. The other the Opposition Paper, with just as much vigor and great plainness, disagrees with everything the government does, whatever it is. Both have large circulations and both are excellent papers.

There are a number of good clubs. The Yankee Consul put me up at the Pará Club, where I met the bankers and steamship and rubber men—American, German and English—and had some really good exercise at billiards in spite of the sultriness that evening often developed.

Then a rubber importer in New York had written the president of the Sport's Club, who invited me to their functions. I also went to a ball at the Universal Club, which must have been a very swell affair, for the streets were lined with people who got their reward by seeing us go in and out.

The resident head of "Casa Alden" also asked me to soap my legs and come out to the Golf Club with him. The saponaceous preliminary



EXAMINING RUBBER FOR SHIPMENT.

that he advised is for the purpose of amusing *moqueens*, small and active red bugs that live in the grass, outside of the city limits, particularly on golf links. If one's legs are soaped the bugs get so engrossed with climbing up as far as the knee, then coasting down to the instep, that they forget all about biting.

More interesting than a city are its inhabitants. The people at Pará are Brazilians and Portuguese. Although the former come largely from Portuguese stock they do not like to be mistaken for natives of the mother country, so proud are they of their own. They are a sensitive, hospitable,

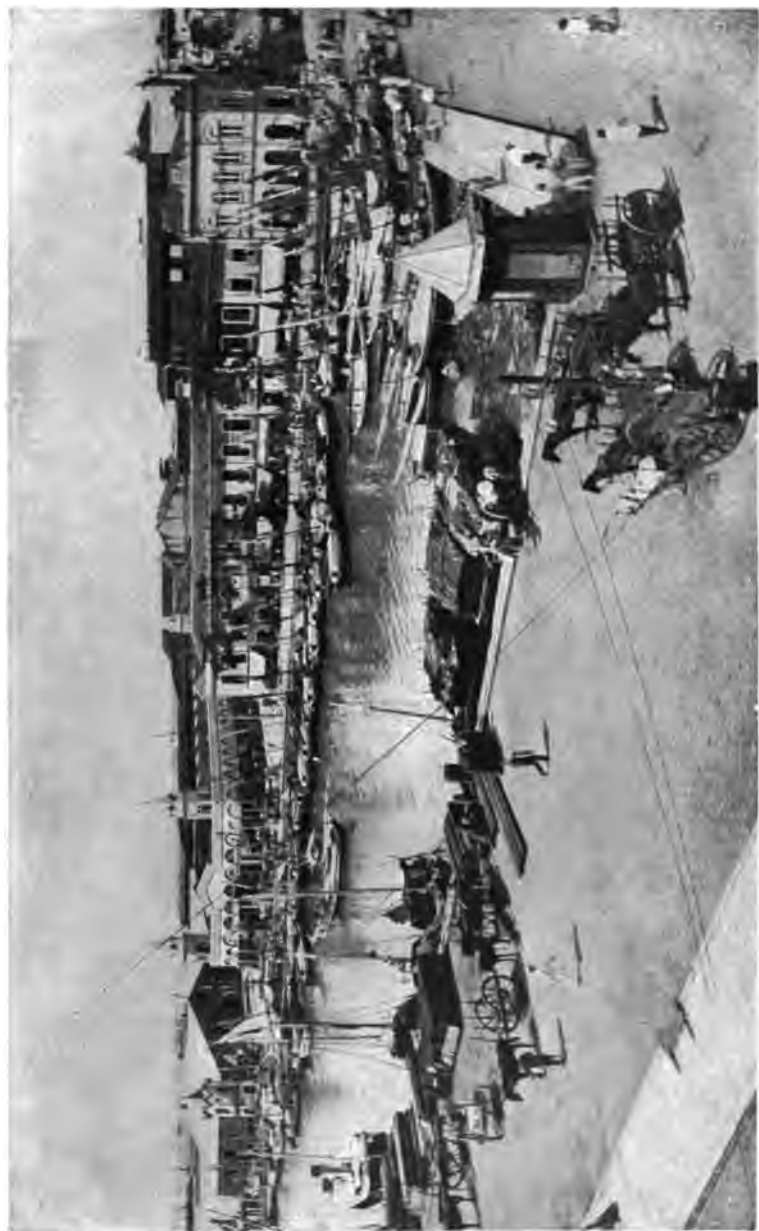
enthusiastic race, with a very decided genius for and appreciation of the fine arts. Many of the substantial business men are Portuguese and one often sees exactly the same types as once made the men of Portugal the foremost explorers of the world. The better class in Pará are exceedingly well dressed and no politer people are to be found anywhere.

It was "carnival week" while we were there, and there was ample opportunity to see the whole city at play. As the beautiful floats passed, the showers of confetti were constant and the flower fights vigorous. Then in the afternoon, when the rain drove the revellers indoors and the cafés were packed to suffocation, a little glass atomizer made its appearance. It was filled with perfume and sold for 4 milreis. How many thousands were emptied in the course of a few hours who can say? No one escaped who came within range, and for twenty-four hours every food product in the city tasted of perfumery. Through all the festivities I saw nothing but good-humored fun, and was wonderfully impressed with the graceful, unconscious courtesy of the people of this tropical city.

Speaking of hospitality, I wish I had space to describe in detail one dinner at the home of a wealthy and cultured Brazilian, a large owner of rubber lands in the Acre, that I enjoyed. It would take pages to picture the cool spaciousness of the dwelling, the beautiful courtyard garden, with its rare blooms and extensive orchid trellises, and the dinner itself, simple and appetizingly elegant, and my host, who in almost perfect English touched lightly on current events in Europe and America and showed a knowledge of Paris, London, Berlin, and New York that made me envious, but I know I could'n't do it justice, and I must pass it simply as one of my pleasantest memories.

Every winter that great educational institution, the Hamburg-American line, gathers together some hundreds of untraveled Americans and projects them upon the people of other climes. They learn many things in the voyages; that is, they have ample opportunity to do so.

Sitting at midday breakfast in the Café da Paz one morning, I knew that one of these great excursion steamers had arrived, for the advance guard of the army that would soon overrun the city began to trickle in. They were a comely, well-dressed, respectable lot, and I viewed them with much interest. The self-conscious swagger (we are all afflicted with it) that the men took on because they felt that many strangers were looking at them in a foreign tongue, was most exhilarating. The half-pitying glances that they cast about were not contempt, but simply embarrassment. They were wondering in their innermost recesses what the well-dressed foreigners thought of these fine specimens of American manhood.



A PART OF THE DOCK SYSTEM, PARA.  
(From Bulletin of the International Union of American Republics).

And those foreigners, sitting erect over their breakfasts, were probably wondering what the wealthy and somewhat noisy Americans thought of the fine specimens of Brazilian gentlemen that they saw for the first time. Both were self-conscious to the last degree, only the Americans showed it and the Brazilians did not.

Having heard that Portuguese was the language of the country, the tourists had a feeling that no one there understood English, or at least not very well, and it came with rather a shock to me that I was also without the pale. My knowledge came this way. Two nice old chaps stopped in front of me and one said:

"Do you speak English?"

"A leetle," was my reply.

"Good! Well, we want to take a trolley ride and go as far as we can. Understand? See?"

"*Si, Senor*, you wish to go up zee balloon. I can arrange him."

"No, no, don't do that. Not a balloon, a trolley car—goes on rails," showing me in pantomime how an electric car ran, and making a buzzing sound that was most illuminating.

"He is off his trolley, yes?" I remarked engagingly to his companion. Then seeing he had left his sense of humor aboard the boat, and they were likely to get away, I went on hurriedly:

"*Oui*, yes, *si Senor*, you wish the trolley tram. The zip car. It is run by zee door. Go out to Sousa. It's quite a long ride out to Sousa and a pretty one, and if you stay aboard the car, it will bring you back saving a transfer."

I got interested in describing these details and forgot my accent. Just as I finished one of the inquirers said:

"You speak very good English."

"So do-you," said I.

"But I come from Boston," was his retort.

"So do I," was mine.

I forgot to say that before I left my table two tourists sitting at another facing me were enjoying huge glasses of excellent Brazilian beer. One of them desirous of knowing the brew, held his glass aloft (he wore cotton gloves, by the way, to protect his hands from yellow fever mosquitos) and, addressing me cordially, said:

"Pilsener? Is this Pilsener beer?"

"Thank you," I replied courteously; "I drink only zee *champagne*. I should be glad of a leetle bottle." And I beckoned to his waiter, while he gulped the remainder of his drink and bolted.



CUTTING AND GRADING FINE PARA RUBBER IN A WAREHOUSE, PARA.

## CHAPTER VI.

PARA'S "WALL STREET"—HOW THE NATIVES ADULTERATE CRUDE RUBBER—  
EXAMINING FOR ADULTERATIONS—HARD WORKING TROPICAL LONGSHOREMEN—  
FRIENDLY RIVALRY BETWEEN PARA AND MANAOS—WHERE RUBBER MARKETS ARE  
REALLY MADE.

THE center of the rubber interest in Pará is, very naturally, where the houses of the great importers, or rather exporters, are located. These are on the water front and are not only easily located by the pleasant smell of rubber with which the air is permeated, but during crop arrivals by the great quantities of rubber arriving and departing in bulk and in cases, often temporarily piled everywhere and anywhere. The carelessness with which this valuable product is handled would be a shock to any member of the Rubber Stealings Committee. Evidently there is no rubber thievery in Pará.

A narrow street running from the water front up into the city, known as "Wall street," is where most of the rubber purchasing is done. When a steamer arrives with rubber for the various *aviadores*, they gather on this street or in an open room that leads off from it, and the representatives of the big buyers being present, the various lots are disposed of. There are brokers, but they do only a fraction of the business.

Each of the rubber houses employs a very capable body of men who receive the rubber, cut and examine it, and pack it in boxes for shipment. The cutting of the rubber is an absolute necessity, as some lots are badly adulterated. This adulteration takes three forms: In one, a substance *tabatinga* is added to the latex, giving a short fibered rubber that is wholly without nerve. The second is the addition of *farinha*, which increases bulk and weight, but also makes the rubber very short and pasty. The third is a mixture of sand and *farinha* which is perhaps the worst of all.

The adulteration of fine Pará by the addition of *farinha* or sand is not new by any means. Back in the '50's Herndon reports that the natives thus "diluted" rubber. The gatherer does not put the *farinha* in altogether for the sake of adding weight; its presence causes a quicker

coagulation, and if he gets in too much he adds a little lemon juice and is able to produce exceeding smooth films, free from bubbles and very quickly. The rubber looks beautifully, that is, until a minute red ant burrows into it and eats the *farinha* out. Then when it is cut open the whole of the fraud is apparent and it is rejected. Of course it sometimes happens that *farinha* rubber is shipped before the ants get a chance at it, and the amount present may be so small that the examiner may not note it when he cuts the *pelles* open. It is necessary for the manufacturer, however, to know whether it is there or not, as the strength of the rubber will show an extra shrinkage if it is present.



PARA RUBBER IN HENERATAGODA GARDENS, CEYLON;

Grown from seed secured in Brazil in 1876. These trees have furnished seeds for more than 600,000 acres of planted *Hevea* in the Far East.

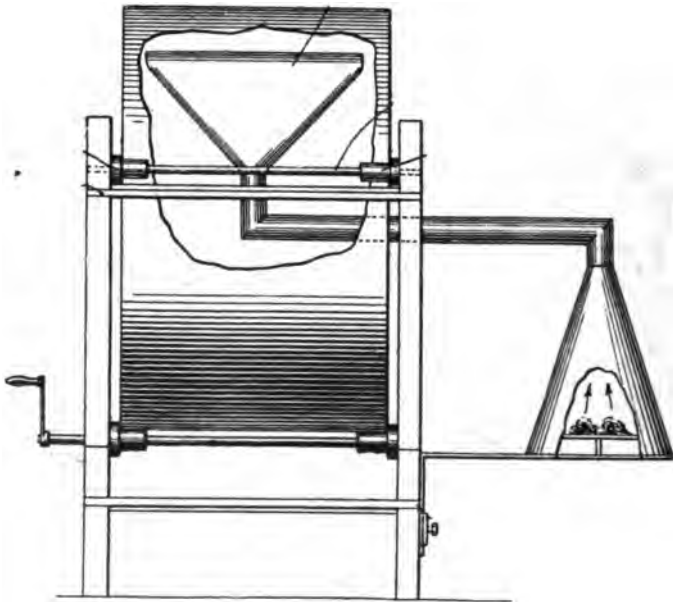
A very simple test is to have a water solution of iodine and potassium iodine which may be applied with a brush to the freshly cut surface. If *farinha* is there the surface will turn from a yellowish mahogany color to blue.

Coarse Pará or Negroheads have ever offered to the careless or dishonest *seringuiero* an irresistible chance to cheat. The ball is made up normally of strips of rubber that have coagulated on the cuts in the trees and from drippings during smoking. How easy to put in a few stones, a bunch of burlap sticky with half coagulated rubber, or a billet of wood as heavy as iron. It gives more weight and at the store



he is sure to get extra supplies for it. These things are therefore added and carefully hidden by an outer coat of rubber and it is months usually before his sin can find him out. The cutting of every *pelle* by the exporter however, and the rejection of those which are not up to grade, has done away with a very much of this sort of adulteration.

To refer again to "Wall street," time was when all the rubber buying was done in a saloon there, but that is a thing of the past, and while some is still sold in the "street," most of the purchasing takes place in the offices of the great operators. Most of the rubber is shipped in cases made of



BRAZILIAN MACHINE FOR SMOKING PARA RUBBER MILK.

American pine. I saw a few boxes made of native wood, but the lumber was heavy and brittle and not to be compared with the imported white pine, either for safety or ease in working.

The rubber warehouse men are perhaps the best paid of any laborers in the city. They receive about \$4 a day, and extra for night work and Sundays. When rubber is arriving they work willingly night and day, often drenched to the skin by heavy tropical downpours, which they don't seem to mind in the least. But the laborers are not the only hard workers. When the gum is arriving, the exporter, if he is in the market, is kept ex-

ceedingly busy. A single small steamer coming in from the islands, where she stopped at perhaps a hundred landings, may have rubber from 200 or 300 shippers, consigned to 75 or 80 different houses. All of these interests, *seringueiros* and *aviadores*, knowing more or less about the market, are intent on getting the best price and also on the passing of any doubtful rubber without question. To do his own house justice and to satisfy the sellers keeps the exporter very busy, and he often works nights, but not out in the pouring rain.

The price at which rubber is sold in Pará and Manáos dominates



TYPE OF STEAMER USED IN THE AMAZONIAN BASIN FOR RUBBER TRANSPORTATION.

the spirit of the people, and in boom times, when money is plenty, it is spent most lavishly. A rich Brazilian, even if it is only temporary wealth due to a sudden rise in the rubber market, will buy anything, from an automobile to an opera *troupe*, and plank down the cash with joy.

Pará being the mother of rubber export has not been without twinges of jealousy over the wonderful development of her daughter, Manáos. She never wished the child to come out of swaddling clothes, because she saw a decrease in rubber revenues as a result. Therefore "Manáos is unhealthy and not a place to visit;" "everything in rubber worth seeing can be seen at Pará," et cetera.

Manáos also affects to scorn Pará. "She's old-fashioned and conservative;" "her rubber forests are rapidly being exhausted," and so on. Then when the representatives of these two great cities meet they are good friends and patriotic Brazilians. Their attitude reminds an American of



DISHONESTLY PREPARED STRIP RUBBER.

the rivalry between Chicago and St. Louis. It harms no one, and it makes both cities more alert and aggressive.

It doesn't take very much perspicacity to figure out the fact that the rubber market is not made on the Amazon, but in the great outside centers, like London and New York. During the crop season in Pará



ROPE CONTENTS OF THE ABOVE.

the operators are in constant communication with their principals in Europe or America, and in semi-constant touch with their houses at Manáos. Each firm has its own cipher. None of them know each other's cipher; whether they know the rest of their numerals, it is hard to say.

## CHAPTER VII.

TO THE "ISLAND OF TIGER CATS"—"OVERTAPPED" RUBBER TREES—RUBBER TREE DISEASE UP THE AMAZON—FOUR-EYED FISH OF THE IGARAPE—EXPLOSIVE RUBBER NUTS—NIPPED BY A CENTIPEDE.

ONE of the leading exporters in Pará is a wonderful producer of artistic photographs. It is natural that he should have taken boat journeys through the islands and up and down the great rivers, not only in search of rubber knowledge but in pursuit of his own particular fad. It was most gratefully, therefore, that I accepted his invitation to take a launch trip to Isla des Oncas, the great island that lies some miles to the south of the city. This island is cut in two by a narrow natural canal which at high water is navigable by canoes and rowboats. To catch the tide meant an early start. So I awoke the Yankee Consul and the Visiting Manufacturer at 4 o'clock, and after coffee we hastened down to the water front, arriving just as the Exporter appeared, with several porters laden with eatables and drinkables.

To cross to the island we embarked in a little three-cylinder kerosene launch and soon were chuff-chuffing across the bay for the "Island of Tiger Cats." Once over to the mangrove-fringed shore, we coasted up and down until finally the sharp eyes of our pilot detected the little opening of the channel. We were then transferred to the rowboat that had been trailing behind.

The launch turned back and we entered the dim tree-shaded channel. In some places it was so narrow that there was barely room for the oars; in other places it was from 10 to 20 feet wide. The water was the same yellow brown tint that the whole Amazon affects. From the start we saw rubber trees—the old settlers that had been tapped for generations, their trunks swollen, scarred and disfigured by thousands of *machadinha* strokes. Often pole stagings had been erected about them, crude contrivances to allow the rubber gatherer to reach hitherto untapped surfaces.

The trunks of the trees as far as one could reach were not only



MANGROVES, SHORE OF ONCAS ISLAND, NEAR PARA.

swollen as if they had woody elephantiasis but the surface was gnarled, twisted and roughened. This surface was covered with a very thin attenuated bark, that often yielded but little latex. The real trouble is not that the tree has been overtapped but that the cuts have been too deep and into the wood. Up to the present time there is no record

of any overtapping of the *Hevea* trees if only the lactiferous ducts are severed without reaching the cambium. As for disease in rubber trees, we are apt to jump at the conclusion that the jungle-grown wild tree is healthier than its plantation prototype.

When the canker appeared on the planted Pará trees in Ceylon all the world knew of it. At once the cry was that nature abhorred man's attempt to coerce her. That tropical trees could not be planted in groves—if they were, that nature would send disease or pest to restore the equilibrium. To an extent this is doubtless true. It, however, assumes that the *Hevea* in its native forest surrounded by trees of



IGARAPE, ONCAS ISLAND.

other kinds is free from fungi and destructive insects. This, however, is not the case. Dr. Hennings of Berlin, Dr. Huber of Pará, and Dr. Ule, all have discovered parasitic fungi on the *Hevea* and on the *Castilloa Ulei*. Not in one place, but from the lower Amazon up to the Andean slopes. The fact is that just as the well fed, right living civilized man is healthier, stronger, and more productive than the savage, so the cultivated *Hevea*, whether in Amazonia or elsewhere, will be a larger, stronger, healthier tree than that which struggles up in the inhospitable jungle.

But to return to our boat journey. On the surface of the *igarape*

through which we were passing often appeared a curious little fish, with a pair of bulging eyes in the top of the head to view the upper world, and another pair underneath to view the nether world. As we got further into the island the waterway broadened. We passed many little river huts, and occasionally met a canoe whose occupants courteously and gravely bade us *bom dia*. The curving stream, fringed with palms,



ASHORE ON ONCAS ISLAND.

hugh *mocco-mocco* plants with white calla like blossoms, and great ceiba trees, was wonderfully beautiful.

Of animal life we saw little; of birds there were parrots and hawks; of animals, one black monkey; and of insects, great blue butterflies, and one huge bird catching spider as big as a saucer.

Our botanist also pointed out a cow tree, that looked as if it

had been much milked. The natives use the milk as a beverage with no serious after effects. It is known as the "*massaranduba*" and it secretes creamy latex, said to be very pleasant to the taste. The milk after standing, ferments and partly coagulates, the product being an exceedingly sticky, resinous mass that may or may not contain a certain amount of india-rubber. It is said that on the upper rivers certain of the balata trees furnish milk that the natives also drink.



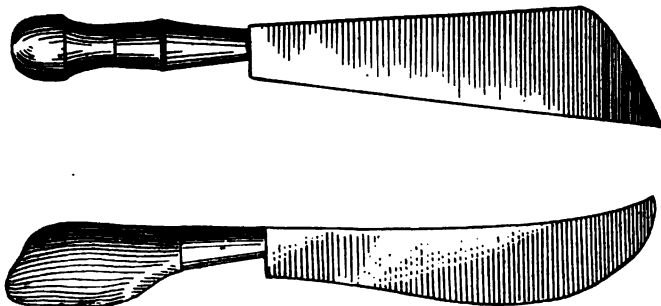
A MUCH TAPPED RUBBER TREE, PARA.

We went ashore and filled our pockets with nuts of the rubber tree as souvenirs. The nut of the *Hevea* looks something like that of the horse chestnut only it is three parted, containing three speckled seeds. They look like smooth, slightly flattened nutmegs. As these seeds ripen, the outer envelope bursts with a sound like a far away pistol shot and the rich oily seeds drop to the ground. A number of rodents, the *agouti* in particular, at the sound of this popping make for the foot of the tree. Here they often encounter a very venomous



snake which lies in wait at the foot of the rubber tree for just such hungry seed seekers.

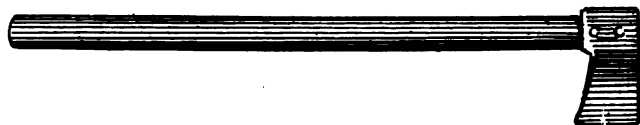
As we were emerging into the river on the other side of the island a sudden shower fell, and we all held a tarpaulin above our heads until it was over. It was then that my companion exclaimed that a wasp had stung him. The wound didn't look like a bee sting, as there



BRAZILIAN BUSH KNIVES.

were two little punctures, close together. Being on the back of his hand he was advised to suck it as a precaution, which he did, and no inflammation followed.

The rain having ceased, the tarpaulin was put away, when somebody said "There goes a centipede," and we caught a fleeting glimpse of something that looked like an elongated earwig which ran into the Visiting Manufacturer's pocket. It was rather a trying experience,



"MACHADINHA," OR RUBBER TAPPING AXE.

but he never turned a hair and sat perfectly calm, while the Exporter with a pair of small scissors very gingerly turned the pocket inside out, but did not find a cent or pede, either. A moment later the insect was discovered in the fold in his trousers, and very dexterously nipped with scissors and thrown overboard. Then we all breathed a sigh of relief, for the bite, though not dangerous, is apt to give one fever for a few days.

## CHAPTER VIII.

THE WONDERFUL MUSEU GOELDI WITH ITS FAUNA, ANIMATE AND INANIMATE—  
RUBBER IN THE BOTANICAL GARDENS—THE WORLD'S GREATEST AUTHORITY ON THE  
"HEVEA" AND HIS TROPICAL WORKSHOP—"SAPIUMS" AND BALATA IN THE AMAZON—  
TAPPING RUBBER TREES AT DAYBREAK—THE IDENTIFICATION OF "CAUCHO"—BRAVING  
THE "DANGERS" OF THE UPRIVER JOURNEY.

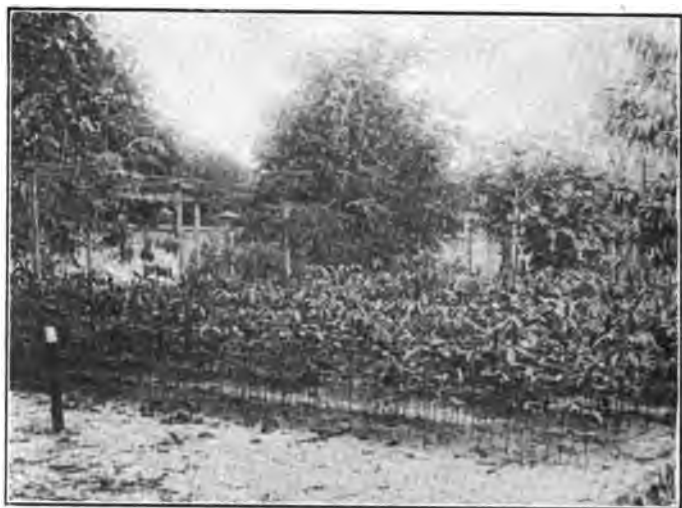
I HAD visited the Museu Goeldi many times while in Pará, and each time was more and more impressed with the natural wonders of Brazil. The museum is crowded with birds, insects, reptiles, animals—or, rather, their carefully preserved cadavers—and a week of careful looking would not enable one to observe in detail a half of what is there. The result is the visitor goes away with a misty and mixed recollection of moths as big as shingles, flies the size of one's hand, beetles bigger than mice, great lizards, monstrous alligators, and snakes of all sizes, colored in infinite variety. Birds grotesque, birds beautiful; animals unbelievably strange, and fish of such infinite variety that imagination itself pauses helpless in stunned surprise.

In cages, dens, and enclosures surrounding the museum buildings are also housed a goodly number of living representatives of those in the cases inside. Not that I spent all of my time either in the museum or the zoological garden, for there is the botanical garden also. And furthermore, there is Dr. Jacques Huber, who knows more about the *Hevea* species than any one else in the world, who has gathered many of the typical sorts about him, and is steadily observing them day by day as they develop into mature trees.

The doctor, by the way, in the course of our many conversations, suggested a new theory for the greater "nerve" in smoked rubber than appears in the unsmoked. He explained that a *pelle*, from the time it is formed, undergoes a natural, continuous, solidifying pressure, caused by the evaporation of the water from the outside layers and their consequent contraction. Unsmoked rubber, on the other hand, put up either in sheet or rectangular block form, experiences no such pressure.

The theory seemed to me worthy of note. I remember that in Panama, in gathering *Castilloa* rubber, we rigged some crude presses to get the water out, and in some instances, where the rubber was left for a long time, its strength was greatly enhanced.

As I have said, the worthy Doctor knows the *Heveas*. He has quietly, patiently, and persistently specialized on them for years. And it was with exceeding interest that I heard him state that the *Hevea Brasiliensis* is after all, the one producer of really high grade rubber. He knew them all from the *Brasiliensis* to the *Spruceana*, and named twenty varieties and their characteristics off hand. One that was new



NURSERY OF YOUNG PARA RUBBER TREES, MUSEU GOELDI.

to me was the *Randiana*, named after the orchid collector Rand whom New Englanders will remember and regret. A very thrifty specimen of this is in the gardens, but it gives no latex. It is this eminent botanist's opinion that many other *Heveas* will be discovered, and he is ever on the outlook for them.

Nor is his attention concentrated upon the trees that produce fine Pará rubber. The *Sapiums*, which are most plentiful throughout the Amazon country, are known to him equally well, and he has gathered ten varieties into the garden for observation. Most of them produce a latex that is exceedingly resinous. One or two species, however, give a good

grade of rubber, and were labor plenty they would be well worth exploitation.

I had many samples of balata from the Amazon region and took occasion to ask him of the *Mimusops* in the Brazils. Just as much at home on that topic as on *Hevea*, he named a dozen varieties and told of sections where the trees are abundant, although the gum is not gathered or valued at present in Brazil.

The learned Doctor has worked for many years in Brazil, oftentimes I fear without the appreciation that his energy and industry have deserved. At last, however, both the government and the world at large seem to be awakening to his value. What he had long wished for,



MUSEU GOELDI—ADMINISTRATION BUILDING.

an experiment station, has been established about 150 kilometers from the city, situated on the railroad that runs down to Bragança, and he is much encouraged. By the by, he has invented a tapping tool that looked pretty good to me. I went out to the gardens at daybreak and saw him "herringbone" some *Hevea Brasiliensis* trees with it. It is interesting to note that they gave exactly the same product for their size as *Hevea* trees in the Far East.

The rubber known as *caucho* had been on the market years before the tree that produces it was identified botanically. For a long time it was claimed that it was an *Hevea* product. In 1898, however, Dr. Huber visited the Ucayali river and, after much searching, was able to find a few *caucho* trees. The difficulty in finding them was due to the

fact those that remained were growing in dense forests far removed from the waterways. It will be remembered that the tree is cut down in every instance to secure the rubber; hence its scarcity. At the time of his visit it was not blossoming or fruiting, and only leaves and twigs could be secured, but these proved it to be a *Castilloa*. Dr. Huber and the Italian botanist Dr. Buscalioni agreed that it must be the *Castilloa elastica*, and it was not until some years later that it was identified as a different species, *Castilloa Ulei*.

To those who are interested in the sources of rubber, cacho was for a long time thought of as existing only on the upper waters of the Amazon, notably in Peru. Dr. Huber and his colleagues, however,



MUSEU GOELDI—RESERVOIR.

found it in practically the whole region of the lower Amazon, the Trombetas, Tapajós, Xingu, and Tocantins rivers. Indeed, it is becoming evident that where *Heveas* flourish *Castilloas* grow equally well, and the reverse is also true. During the year 1909 the state of Pará shipped nearly 1,000 tons of cacho.

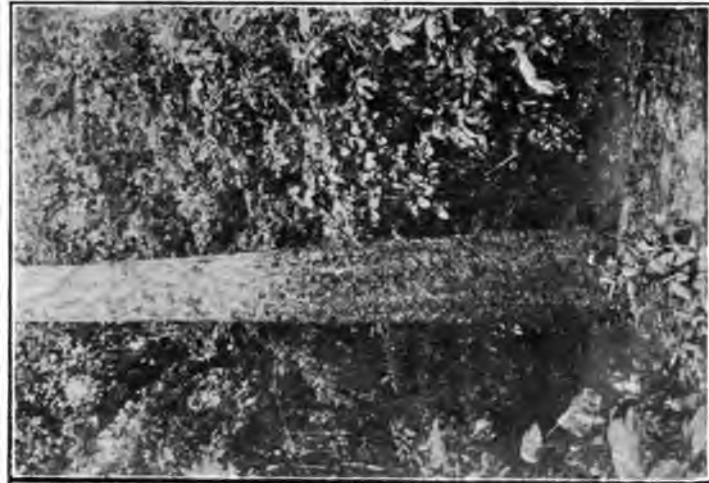
I dislike exceedingly to confess it, but I got badly frightened in Pará and came very near taking boat back to Barbados and sending the usual excuses to friends in Manaós, such as "important cables," "business complications," or the like. It came about this way. The friendly Americans and English resident there are delighted to receive and entertain fellow countrymen. Many of their visitors, however, are woefully unfitted for tropical life and make ideal "fever food." Others pay



Thirteen Year Old Rubber Tree Showing  
Herring bone Tapping.



Dr. Huber Tapping Rubber Tree.



Typical Wild Rubber Tree in Forest near Gardens.

*HEVEA BRASILIENSIS*—THE RUBBER TREE OF THE AMAZON.

no attention to cautions, but go out and hunt for fever, and find it. Then resident friends are obliged to answer frantic cables, furnish physicians and nurses, and stand the brunt of all the worry. Oftentimes, too, they supply the funds necessary for cure or decent interment. They



THE TREE FROM WHICH CAUCHO COMES, "CASTILLOA ULEI."

are perfectly willing to do this—that is the former—and their kindness and generosity are spontaneous and without limit, but the strain tells.

If they are somewhat fearful for a visiting friend in Pará they are doubly so for one who goes to Manaus. When, therefore, one after another showed me cables and letters full of fever stories from

the upriver rubber center it began to make an impression, and I found myself formulating reasons for dodging. But if one will only dose one's self with a sufficiency of forebodings, a reaction is sure to come, and courage returns. This was my case. And of a sudden I found myself determined to discover what Manáos would do for me. Further



"HEVEA RANDIANA"—A BARREN RUBBER TREE.

than that came the belief that with common sense and care I should probably get through all right. They were exceedingly nice, those friends of mine, when I rendered my decision. One, with a whimsical smile, said:

"It's sure to be interesting anyhow. Say your prayers and trust in *cascara*."



Another secured for me the *cabin de luxe* on a fine Hamburg-American boat and outlined a river journey princely in its comfort and very speedy. This I refused, although with real regret. I had my eye on one of the smaller Booth boats that had accommodations for only sixteen passengers and would carry on that trip only two, myself and companion. It was a freight boat, going upriver almost empty, which would mean hugging the shores to avoid the current. It was a rubber boat, and its captain had been making the river journey for 30 years. There would be no shuffleboard, no pleasantly wasted hours in the smoking room, no fascinating acquaintances. All of which would give me added time and opportunity for observation and work.

We boarded the boat in the early afternoon and the Captain promptly gave us the run of the ship. There was no social hall but the chart house deck, above which was the bridge, was roomy, high above the water, screened from sun and rain, and, although the Captain's private domain, he made it ours for the river voyage. If I had outfitted a swell ocean going yacht the equipment would not have been as practical as that afforded by this steady, roomy, matronly freighter.

The anchor came up about 5 in the afternoon and, facing a pleasant breeze, with half of the propeller out of water, "grinding air," we started out through the tangle of low, heavily-wooded islands that cluster about the mouths of the Pará and Tocantins rivers, heading for the "Narrows" in the care of two Indian pilots who knew the many channels day or night by instinct. Unless it came on to rain very heavily we would run all night. It was soon too dark to see much, so I turned in.

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## CHAPTER IX.

HOW THE PARA RUBBER TREE GOT ITS NAME—A BIT OF BOTANICAL HISTORY—  
GRADES OF BRAZILIAN RUBBER—HEBREW PEDDLERS ON THE AMAZON—DISTRIBUTION  
OF THE INDUSTRY—OUTFITTING THE RUBBER GATHERERS—THE RUBBER GATHERER  
AND HOW HE LIVES—LOCATING THE PARA RUBBER TREES—TAPPING AND COLLECTING  
OF RUBBER DESCRIBED IN DETAIL.

THE present botanical name for the tree that produces the best grade of Pará rubber is *Hevea Brasiliensis*. Those who write informing articles on India-rubber from ancient encyclopedias are very apt to speak of the tree as *Siphonia elastica*. As a result there has been some confusion. This is what happened.

In 1775 the botanist Aublet named a Pará tree found in French Guiana as *Hevea Guyahensis*.

In 1807 Persoon thought *Siphonia elastica* sounded better and so renamed it. The name stuck for about 60 years.

Then Müller reestablished the name *Hevea* and the whole botanical world to-day stands by his decision.

The rubber that is collected in the state of Pará comes in three grades: fine, ( *fina*), medium (*entrafina*) and coarse (*sernamby*). This latter grade is known in England as negro heads. The rubber gathered on the island of Marajo and other islands and on a portion of the mainland is classed as Islands rubber. An especially good grade known as Caviana comes from the island of that name. Other rubbers produced chiefly on tributaries of the lower Amazon are Cameta from the Tocantins river; Xingu from the river of that name and Itaituba from the Tapajos. Upriver rubber is the general name for all of the rubber coming from the state of Amazonas and the upper tributaries of the Amazon. This is, of course, Pará rubber in the three grades aforementioned and is graded as Manáos and Madeira. The products of the great rubber producing territory in Bolivia, Peru and the Acre are also known as Upriver.

Curious bits of history as to the early trade in Pará rubber are constantly cropping up. Back in the early '90's the lower Amazon was overrun by Hebrew peddlers who went about in boats, supplying whatever

would tempt the rubber gatherer and for a time they practically monopolized the rubber trade there. The State, however, put a tax of \$500 a head upon them and while it did not actually drive them out of business, it checked them so that other merchants had a chance.

Fine Pará is brought to the city in bulk, the coarse often being strung on lengths of bush rope like a huge necklace. Both fine and



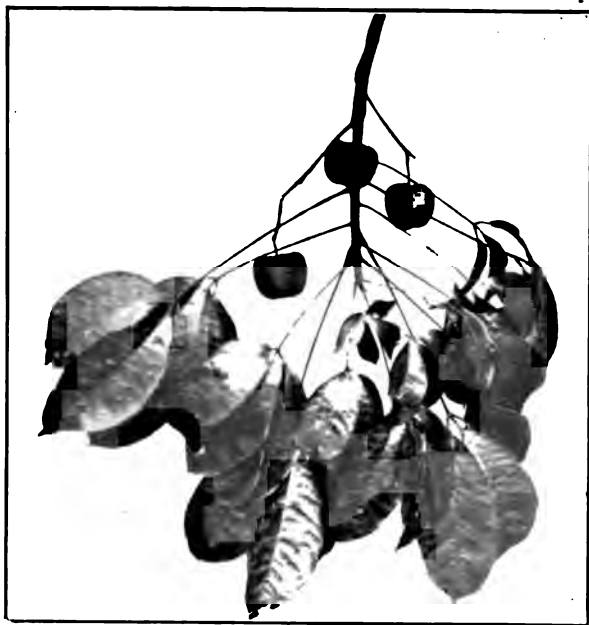
"HEVEA BRASILIENSIS," THE PARA RUBBER TREE.

coarse are sometimes packed in barrels and if the receptacle be tight it is filled with water to prevent shrinkage.

To show how generally rubber is distributed throughout the state, 49 of the 53 municipalities produce it; the bulk coming however, from 35. Each municipality is governed by an *Intendente* with a power to assess local taxes, all of which are collected at Pará. On rubber they amount to  $\frac{1}{4}$  to  $\frac{1}{2}$  a cent per pound. This is in addition to the regular state export tax of 22 per cent. When steamers arrive from any of these

municipalities, at Pará the captain is obliged to produce an exact manifest of cargo and submit it to the *recebedoria* and only when they issue a clearance certificate can the consignee secure any portion of the cargo

The beginning of rubber production is really with the *aviador*, who furnishes the rubber producer, or *seringueiro*, with all supplies and, in return, receives and sells his rubber. The *aviadores*, and there are hundreds of them, big and little, have outfitting places not far from the water front in Pará and Manáos. Some of them are not much more than offices;



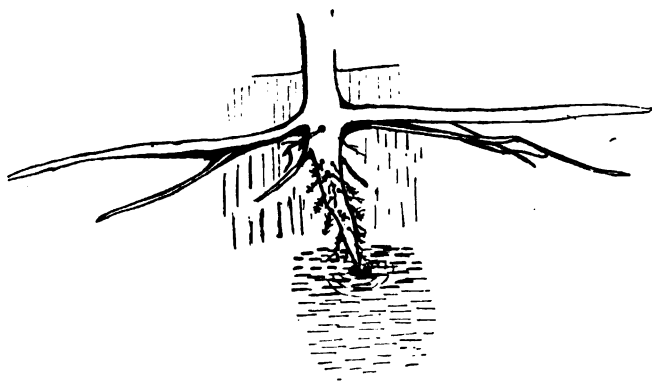
LEAVES AND NUTS FROM THE "HEVEA BRASILIENSIS."

others are great and well-stocked stores. When an *aviador* discovers what a *seringueiro* is going to need for the coming season, he supplies what he may have from his own stock, which may be much or nothing. He then divides the order into dry goods, provisions, etc., making up separate orders for city merchants who handle these goods. They fill the orders, packed and delivered on the pier for shipment. The *aviador* then bills these goods, accepting in payment therefor, notes that range from three to six months. These notes are discounted by the local banks, and sometimes are extended for another six months, if times are hard. The

discount rates are from 10 to 24 per cent., according to the standing of the merchant.

The *aviador* is overcharged in his purchase about 50 per cent. by the general merchant. This is because of the risk that the latter takes, as some *aviadores* never pay at all, while others may not be able to pay for one or two years. When the *aviador* receives rubber he sells it for the *seringueiro*, who is credited with the amount received. In remitting to the *seringueiro*, if money is sent, the commission is 20 per cent.; if merchandise, 10 per cent.

In times past, according to the stories of some rubber merchants, it



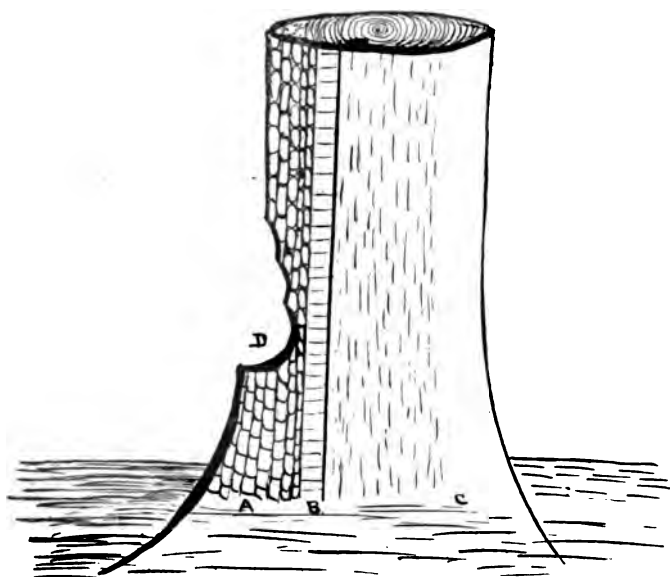
RUBBER TREE GROWING ON RIVER BANK.

(Showing taproot reaching barely to the water. The laterals never thrive where it is permanently wet.)

was an exceedingly easy thing to become an *aviador*. One asset only was necessary. That was the friendship of a director of a local bank. The man who planned to become an *aviador* would register his firm at the *Junta Commercial* with a capital perhaps of 50 *contos*. Through the director he would discount notes for that amount. This money would be used for buying shares in that bank, which would be pledged in another bank for a certain amount. This money he would deposit in a third bank. By this means the *aviador* was able to give two banks as references. In one of them he was a stockholder to the amount of about 45 *contos*, and in the other a depositor of 40 *contos*. Without a cent of money of his own, he would be rated as being worth about 100 *contos*. When he there-

fore sent letters to rubber producers offering to outfit them and sell their rubber, they were much impressed and he got the business.

The manner just cited is not the usual way, by any means, and it could not be done to-day. The bulk of the rubber business is built with real capital and many of the *aviadores* are *seringueiros* who, selling their places or retaining them as they choose, established themselves in Pará or Manáos as *aviadores*. The *aviador* is the most generous man in the world in certain respects. He will gladly supply the *seringueiro* with two or three times as much as he orders, and when the proper time comes take



SKETCH SHOWING TRUNK OF HEVEA BRASILIENSIS AND  
LACTIFEROUS TUBES MUCH ENLARGED.

A—Latex tubes in bark.  
B—Cambium.

C—Wood.  
D—Proper depth of cut.

a mortgage on his estates, and very rarely is the mortgage liquidated. Indeed, many times it is foreclosed and the *seringal* or rubber estate thereafter is the property of the *aviador*.

The *aviadores* also attend to another detail of the rubber gathering business, which is the arranging for contract laborers. Each year, before the beginning of the rubber season, they send agents to Ceará, Rio Grande do Norte, Parahyba and Piauí, where abide the hard-working Brazilians, commonly known as the "*Cearenses*." They live very well by culti-

vating the land and raising cattle; that is, when the rains are regular; but one dry season works great havoc. Their crops are destroyed, the cattle die of hunger and thirst, and the Amazon and rubber gathering is all that stands between them and starvation. It is usually necessary for the agent of the *aviador* to advance a little money and pay the passage of the laborer to the *seringal*. These advances are later deducted from his earnings.

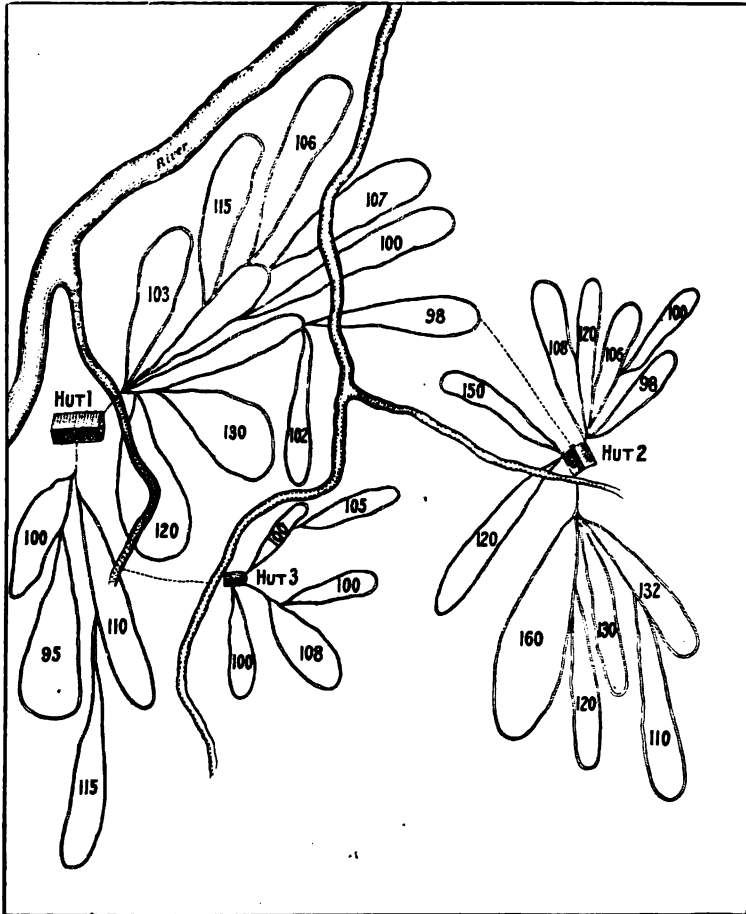
The *Cearense*, with what little baggage he owns, including always



DWELLING OF RUBBER GATHERERS ON THE AMAZON.

a gaudy handkerchief and a business-like stiletto, is loaded on one of the small river boats with hundreds of others and started on his journey. This is at the time of high water, the start being made in the latter part of March or the first part of April, and it is probably the beginning of May before the *seringal* is reached. Here he is installed in one of the thatched huts provided for the laborers, if he has his family with him; if he travels as a bachelor he may sling his hammock in a large thatched house with the rest of the unmarried men.

A *seringal* is really a little village, which centers about the big frame house roofed with tile where the manager lives, where is also the office and the store. Round about this are grouped the thatched huts of the



PLAN OF A "SERINGAL."

(Showing *Estradas*, Number of trees in each, and *seringueiro*'s huts. Hut number 1 houses 7 men, who work 15 *estradas*; number 2, 6 men 12 *estradas*, and number 3, 2 men, 5 *estradas*.)

laborers. These villages are located on rising ground beyond the reach of the river, and cut off as they are from the rest of the world for months at a time, the manager is really absolute ruler.



The Amazon begins its great rise in December, and the land is not uncovered so that men can work until about the middle of May. During all of this time the tapping of rubber trees is discontinued. The laborers who remain, spend their time in smoking and sleeping and in endless



"SERINGUEIRO" GOING HIS ROUNDS.

trivial gossip. Occasionally they take too much *cachaca* and do some desperate fighting. According to a physician whom I know, whose practice lies in the waterways above Iquitos, the Cearenses do a good deal of shooting at each other. One of his chief duties was the extraction of bullets from rubber gatherers' arms and legs. He said they never seemed to hit each other in the body, and it was only rarely that one was killed.

His fee, incidently, for extracting a bullet was paid in rubber, and at present prices would be about \$1,000.

As has been often explained, a tropical forest rarely shows a preponderance of any one kind of tree. It is a heterogeneous crowding of hundreds of different kinds of trees, criss-crossed and lashed together by giant vines. Where the rubber trees flourish they may be thirty feet apart or hundreds of feet apart. They certainly are never close together. In order to work them, narrow pathways are cut through the forest, leading



TAPPING A PARA RUBBER TREE.

(The *seringueiro* holds a hatchet in one hand and in the other a latex cup; several cups have already been attached to the tree; he carries a can for collecting latex and always a gun.)

from one tree to another in some general direction, until 50 or 60 trees have been located. The path then turns, either to the right or the left, and is continued back to the central camp from rubber tree to rubber tree. This makes a very irregular ellipse and is called an *estrada*, or path.

The rubber gatherers do not waste effort, and if the reader has pictured a sylvan pathway, broad and smooth and easy to traverse, he is going too far. A stranger, unused to a forest, would never suspect the

existence of these paths, and once he was on one would have difficulty in following it.

The first thing the laborers on a *seringal* are set at, when a new season begins, is the cleaning of the old *estradas*. Five or six months in a



"SERINGUEIROS" BRINGING HOME LATEX.

tropical forest bring great changes. Huge trees have fallen across the paths, dragging others in their fall and often making impassable barriers around which a way must be cut. Vines and young trees have sprung

up and grown enormously, and everything that nature could do to efface man's work has been done. So that the cleaning of the *estradas* is no light task. It means not only reopening the path, but cutting a circle about two feet wide around each rubber tree, so that there will be room to work. Then comes the opening of new *estradas*, if there are laborers enough to work them. And next in order is the tapping.

This starts very early in the morning. The *seringueiro* rises at 4 o'clock, boils some coffee which he hurriedly drinks, and, provided with a *machadinha*, or little tapping ax, and several hundred tin cups, starts barefooted for his *estrada*. When he reaches the first rubber tree he attaches as many cups as the size of the tree warrants, usually in a circle as high up as he can conveniently cut. These cups are attached directly under the cuts, and catch the latex or rubber milk as it flows out.

The capable rubber gatherer carries a little finely kneaded clay to stick the cups to the trees if he uses clay cups; if he uses tin ones the top is bent over and caught under the bark. A great many gatherers rub the tree down with cocoa husks before tapping. This removes mosses and enables them to affix their cups much more easily. A native gatherer will often point out a tree calling it *cancado*, which means that it gives little latex and is diseased and not worth tapping.

There is a great difference in trees as far as the production of latex goes. Some bleed freely, others reluctantly; some furnish thick, creamy latex, others thin latex, and occasionally one gives none at all.

Although alone in the jungle that shelters many wild beasts and venomous snakes, the rubber worker is very rarely molested. The wild creatures all get out of the way of man when they can. To be sure, if the tree tapper should leave his pile of tin cups for a short time, a trouble seeking monkey might swing down from the branches above, lift the stack, and throw it high in the air just for the delight of seeing the cups scatter.

From tree to tree goes the rubber tapper until all on his *estrada* have their girdle of cups. He now discards the tapping tool and, taking some vessel, very frequently an empty kerosene can, begins the collection of the latex. His first visit is to the tree first tapped, where the latex has probably ceased running, and the cups may be a quarter, a half, or nearly full, depending on the productiveness of the tree. By the time he has finished this round and collected all of the latex it is 9 or 10 o'clock, and he is ready for breakfast. This he prepares himself and it usually consists of dried beef and beans, always accompanied by *farinha*.

## CHAPTER X.

THE SMOKING OF THE RUBBER MILK—PALM NUT FUEL—WHAT BECOMES OF THE DRIPPINGS—BRANDING—METHOD OF COLLECTING "CAMETA"—INDIANS AS NATURAL BOTANISTS—SIZE OF RUBBER TREES—VARIOUS INVENTIONS FOR PRESERVING LATEX AND SMOKING THE RUBBER MILK—BLENDING OF OTHER RUBBER MILKS WITH HEVEA—TAPPING SEASON.

THE rubber worker is now ready to do the day's smoking. On the fire smoldering in his hut he heaps some of the heavy oily nuts that are borne abundantly by the "urucuri" palm (*Attalea excelsa*). Over this, if he has it, he places a funnel that is like a truncated cone open at each end, part of the lower edge being cut away to make a draught. Until recently these cones were made of earthenware and were heavy and rather fragile. To-day the *aviadores* supply them in sheet iron with handles on the side. These are much more portable and not breakable, but the *seringueiros*, that is, the old expert ones, detest them. They complain that the iron throws off so much heat that their work is much more disagreeable than when they used clay cones.

When the smoke is coming thick and hot from the funnel, the *seringueiro* winds a bit of freshly coagulated rubber about a piece of wood, shaped something like a canoe paddle, and thoroughly dries it in the smoke. Then he dips this in the latex and holds it again over the smoke until that film is dried. Over and over again he repeats this process, the ball growing in size with every dipping. Where large balls are to be made that cannot easily be handled, a rest is made by driving two forked sticks into the ground with a cross piece connecting them. In the middle of this cross piece is a loop of bush rope into which one end of the pole holding the rubber ball is thrust. The *seringueiro*, grasping the other end, swings the ball over the smoke and turns it easily. As a further assistance a loop of bush rope coming down from the roof of the hut helps the laborer to hold his end of the smoking pole.

Quite a variety of palm nuts may be used in smoking. The best are said to be the "iuaja" (*Masumilcno regno*) but they are hard to find. The

urucuri (*Attala excelsa*) is what is commonly used. What is known as the "uanassee" is also used but is said not to give as good a result, although these nuts are very abundant and easily obtained. The palm nuts used



THE URUCURI PALM.

(The nuts of which are used in smoking Pará rubber.)

are as large as a small hen's egg, are very solid and full of oil, and produce a dense rich smoke and a hot fire. The peculiar odor of these burning palm nuts penetrates the forest for long distances and is often

a help in locating the camps of the rubber gatherers. Just what the smoke of the palm nut does that other smokes will not accomplish the Indian does not know. He explains that it is *o pungimento* (the strength) which is a good explanation as far as it goes.

A part of the process of coagulation that is not generally described and indeed that many say does not exist is heating the latex before applying it to the paddle that it may coagulate more readily. Many have stated that the latex of the *Hevea* produces  $\frac{1}{2}$  of its weight in rubber. Actually it is about  $\frac{1}{3}$  for an average. Careful workmen rub the paddle with clay to keep the rubber from clinging too closely to



CAMETA, ON THE AMAZON AND TOCANTINS.

the wood. They also warm the paddle thoroughly in the hot smoke before they begin.

As the rubber is coagulated, the color of the *pelle* is first a silver grey, then yellow, and finally almost black.

The smoked biscuit is very soft when it is first formed and sweats a great deal of water. It is laid with the paddle still in it on a board to dry out over night. The next morning it is cut off and there is still so much water that the rubber cuts like cheese.

Much of the latex coagulates in the air. This is in the form of thin films on the sides of the vessels, drippings in various parts of the camp, and latex that started to coagulate before there was time to smoke it. This forms the grade known as coarse Pará.

Day after day until Saturday, the *seringueiro* pursues his monotonous task. On that day, he, with half a dozen others or more, whose *estradas* join his, take their balls of rubber to the *seringal*, where they are credited with the number of pounds gathered, at say 50 per cent. of the market value as they know it. The other 50 per cent. is to indemnify the owner of the *seringal* for shrinkage, freight, and so on. The rubber ball is then branded with the mark of the *aviador* and stored awaiting shipment. Often times too it is sunned with the result that the outer surface becomes very dense preventing the moisture that is on the inside from escaping.

His week's work finished, the *seringueiro* goes to the store, gets supplies of provisions for the next week, not forgetting plenty of *cachaca*, which are debited to him at about 100 per cent. above the cost price.

The owner of the *seringal* makes his profit almost entirely out of what he sells to the *seringueiro*. The latter is obliged to buy goods only at the store, or else hunt some other *seringal*, the owner of which must assume his debt, which always exists, with a 20 per cent. increase for the transfer.

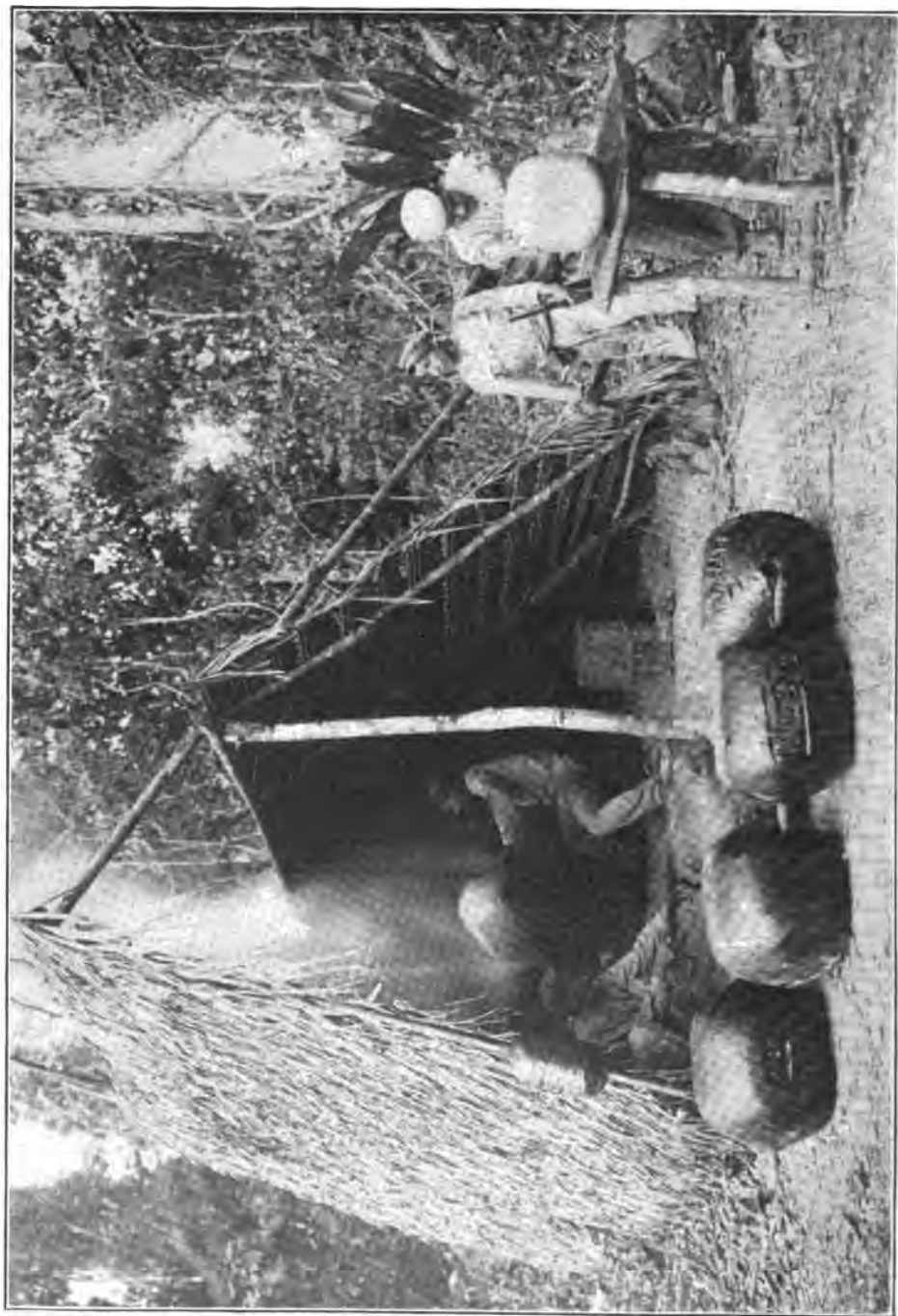
The grade or rubber known as Cameta is a *sernamby* that is not smoked but coagulates in the cups on the trees. The *seringueiros* like to gather rubber in this way as it avoids the trouble of smoking. Beside this, if perhaps they can tap 150 trees if they are working for *fine* they can tap 250 if they are after Cameta. This rubber is much inferior to *fine* and brings less in the rubber market. Therefore the state revenues are much less. In order to force the rubber gatherers to produce more *fine* and less Cameta the state of Pará seriously considered putting a tax of 10 cents a pound on Cameta.

A native rubber gatherer, knowing nothing of botany, in fact ignorant of almost everything except his own particular craft, can pick out a *Hevea Brasiliensis* from any other *Hevea* at sight. Something that he detects in the texture of the bark, in the way the tree grows, enables him to decide at once and he is always right. The expert botanist, however, is obliged to see the flowers and even then the differences between the various *Hevea* blossoms are so slight that he may be in error.

Years ago it is said that the rubber gatherers were in the habit of taking a length of bush rope, looping it about the foot of the rubber tree, close to the ground, then twisting it tourniquet fashion, after which they tapped the tree. This was said to exhaust the tree and was prohibited by law.

The size of Pará rubber trees has been variously stated. Cross



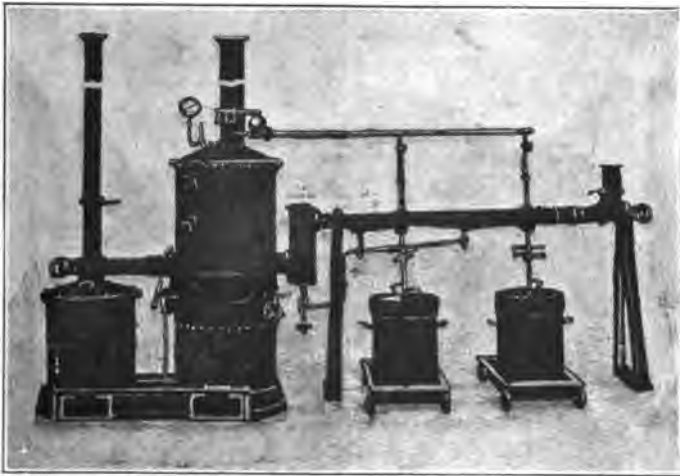


SERINGUEIROS SMOKING PARA RUBBER.

(In the foreground are shown some *pellets* of rubber ready for market.)

measured many in the lower islands, particularly on Marajo, and found them to be from 3 feet to 6 feet 10 inches in circumference 3 feet from the ground. He saw no trees that were more than 60 feet in height, although the forest there affords other trees that are 80 to 100 feet in height. Wickham exploring the plateau lying between the Madeira and Tapajós rivers, land that is never inundated, found mature trees 10 to 12 feet in circumference and 70 and 80 feet in height.

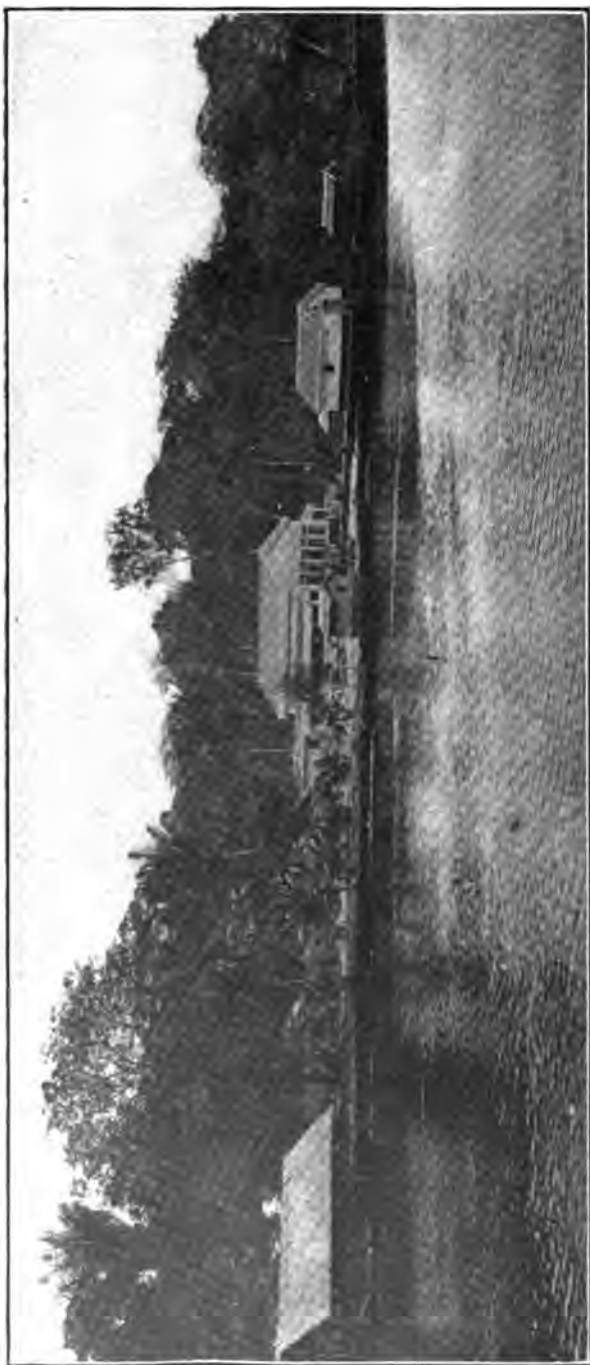
The native method of smoking may not always be followed in Brazilian forests. Numbers of other processes have been experimented with. It will be remembered that Brazil exhibited at the World's Fair in Chicago, 1893, samples of Pará rubber which had been coagulated by



BRAZILIAN MACHINE FOR COAGULATING LATEX.

adding sulphate of alumina to the latex. It was believed that this would revolutionize the smoking process, and be much quicker and cheaper. The rubber, however, was found to be quite brittle and rather short lived and the process never came into general use.

Various processes for preserving the latex so that it should not coagulate before the gatherer had an opportunity to smoke it have also been invented by Brazilians. There was, for example, the Torres system, by which a liquid added to the latex preserved it for more than twenty hours. This preservation was said to be made of a combination of the juices of a number of vines, the names of which were kept secret. This was invented in 1894, but never was adopted by the rubber gatherers.



A BEAUTIFUL FAZENDA NEAR BREVES.  
(Owned by a Wealthy *Arador*.)

Ten years later Pozelina appeared. This was also a secret compound and it was claimed for it that it added to the value of the rubber 50 per cent. but the *seringueiros* would have none of it.

In 1908 Seringuina appeared and the inventor received many assurances of interest on the part of the Brazilian government. Bottles of latex preserved by it, were sent to the writer in New York and the rubber milk is still sweet and uncoagulated. So far as is known, however, none of the large operators in crude rubber have made it useful at their *Seringacs*.

Years ago appeared a machine for smoking latex known as Coutinho's. Ten years later, improved, it again appeared as Danin's. Both inventors were Brazilians who were perfectly familiar with the native methods of curing rubber and their manifest inadequacy. The improved machine has a hollow cylinder into which both smoke and latex are admitted. As the cylinder is rotated the latex spreads over the inner surface, is brought in contact with the smoke, coagulates in thin films, and is cut off in sheets when the process is finished.

A recent instance of Brazilian alertness was the invention of the DaCosta Smoking Coagulator which is used not only in Brazil but on the great rubber plantations in Ceylon and the Federated Malay States. The apparatus is a simple arrangement of steam-boilers and smoke furnace whereby steam and smoke together are forced into cans of latex until coagulation is effected.

The proportion of coarse or *sernamby* varies with different localities. In 1903-04, 50 per cent. of the rubber exported from Pará was *sernamby* while of that exported from Manaós the proportion was only 20 per cent.

It is a question how much real Pará rubber, that is, rubber made wholly from *Hevea* milk, appears in the market. Dr. Huber long ago called attention to the fact that rubber gatherers were in the habit of tapping *Sapiums* that were near the *estradas* and mixing that latex with that of *Hevea*. Wherever in the Amazon basin the *Hevea Brasiliensis* is found there also flourishes great variety of *Sapiums*, many *Minusops* and other trees that are abundant latex producers. Left to themselves the *seringueiros* are sure to mix in any milks that will coagulate. Indeed, as the learned Doctor observes, perhaps they get a tougher and better product for so doing. However this may be, it is certain that for some reason or other, the rubber made from the pure *Hevea* milk in the Far East has not yet shown the nerve that is characteristic of upriver *fine*.

The tree tappers are not careful of the trees. Naturally improvident

they would destroy them in one year if it meant more rubber, but fortunately more rubber cannot be gotten in this way from the *Hevea*, and so the trees survive and continue to produce year after year. There



SPIRAL TAPPING OF "HEVEA BRASILIENSIS."

are stories of rubber gatherers on the upper reaches of the river who build fires about the bases of the great trees to stimulate the flow of latex, but no one seems able to verify such tales.

The tapping season may last from three to six months. This depends on location, and on the size and condition of the trees. Sometimes the trees are tapped daily, sometimes every other day. Often they are given a rest for a year. The amount of rubber secured per tree is difficult to estimate, but it probably does not exceed two or three pounds, and in some districts that have been constantly worked for a number of years even less than that. Old rubber men tell stories of *estradas* of a hundred trees that would turn in 20 to 30 pounds of rubber a day, but they agree that the time of such production is long past.

The age at which Pará rubber trees are big enough to tap depends largely upon their surroundings. Cultivated trees may be tapped when they are four to five years old, that is if the tapping be done carefully. These that grow in the partially cleared forest will take from 10 to 15 years to arrive at the tappable size. Pará trees, selfplanted, that manage to struggle up in the dense forest, probably take 25 to 30 years to attain to the proper size for tapping.

The actual extent of the rubber forest in the Amazon country is unknown, but according to those who have done a good deal of exploring only the fringe has been touched. The *seringaes* and temporary rubber camps are all located along the waterways.

This means working the territory about a mile inland. The rest of the forest, comprising thousands of square miles, is as yet untouched. This is true not only in Amazonas and the other great interior states, but of the state of Pará as well. With labor and proper exploitation four times as much rubber could come out of the Amazon as is obtained at present.

The securing of laborers is the most difficult part of the undertaking. To get a rubber estate in the Amazon valley is easy. Millions of acres of land with rubber trees are without owners. The land costs nothing, the government exacting a fee only when it is registered.

## CHAPTER XI.

THE SOURCE OF THE AMAZON RIVER—EARLY TRADITIONS—THE START UPRIVER—  
THE NARROWS—FOREST SCENES—OUR BUTTERFLY HUNTER—BREVES AND THE  
ANCIENT CHANNEL—THE RIVER CABLE AND ITS INTERRUPTIONS—THE WIRELESS.

FAR up on the eastern slope of the Peruvian Andes is a tiny lake-  
let of ice-cold water from which flows a little brook. As this  
increases in size and gets large enough to be worth naming, it is  
called Tunquragua; further down it becomes the Marañon, the Solimões,  
and the Amazon. Indeed, it is the Amazon from the little Peruvian pond  
to the great 158 mile wide delta, thousands of miles to the east. The  
great river takes its name from a tradition that its shores were peopled  
with bands of warlike females, whose fierceness appalled even the early  
Spanish adventurers. Perhaps there were such. Their descendants,  
however, have changed, for no quieter, more peaceful, unobtrusive  
women exist anywhere to-day, than in the basin of the Amazon, whether  
Brazilian, half breed or Indian.

Many picturesque stories come down to us from the hardy and  
adventurous pioneers of the past. There was Sir Walter Raleigh's  
narrative of a race "with eyes in their shoulders and a huge mouth  
situated just below the clavicle." Then, too, there were those who saw  
in the cow-faced *manatee*, suckling its progeny from a pair of leathery  
breasts, a beautiful water woman or mermaid. Of the great river  
itself, however, they saw only what was so, and early described its  
great delta with a current felt more than a hundred miles out at sea.  
They knew, too, of the northward sweep of the Amazon and of how  
it had built and was building the fertile lowlands of Dutch and British  
Guiana by its vast deposits of Amazonian mud.

Every one asserts that there is no need of mosquito bars going  
up or down the Amazon, but I had mine adjusted in spite of the  
pitying smile on the face of my companion, who didn't unpack his. I  
had an extremely self-satisfied feeling when I awoke about midnight and  
heard him at work hastily getting his protector into position. Not that  
the mosquitos were bad or numerous, but they were aboard. I was

up at light and, after a bath in the alluvial soup the river furnishes, went on deck. The boat was ploughing through a lakelike expanse of water, with islands in all directions. It is difficult for one who has not studied this subject particularly to appreciate how many thousands of islands, big and little, are crowded into the lower Amazon.

As the river was rising we passed through and by acres of floating grasses, weeds, and logs, the larger masses being easily avoided. About 10 o'clock we entered the Narrows, our channel being perhaps 300 yards wide. On either side the low lying alluvial shores were thick



AN ISLAND IN THE LOWER AMAZON.

with palms of various kinds, together with Spanish cedars, rubber trees, acacias, and a great variety of hard woods, over which ran a riot of vines, big and little, every inch of land far out into the water being crowded with luxuriant vegetation.

At close range the forest is so dense and covers such an area that one does not easily appreciate how huge some of the trees are. When one measures, however, a silk cotton tree that is from 30 to 40 feet in circumference, and they are not uncommon, one's ideas are modified. Many of the vines and trees were masses of beautiful flowers, and while the epyhites and orchids that clung to and clustered on trunks and branches did not show many blooms, they added to the decorative effect wonderfully. We looked here for the *manatee*, or



sea cow, which lives out its quiet uneventful life in these waters, shyly avoiding everything animate everything but its own kin. But we had no luck.

Every now and then we passed a *seringueiro's* hut, or *barracão*, close to the water's edge, built on posts above the rise of the river, while in front of it were tethered one or more canoes, the only means of transport, and indeed of refuge, when the water is very high. These huts were simple in construction, made of poles lashed together with bush rope, the sloping roofs covered with broad palm leaves. The floors



SCENE IN THE NARROWS.

were of rough hewn logs, with a pile of clay or earth for a fireplace, and no chimney. Oftentimes the whole front of a hut was open. So close did we run to the shore that we could see the owners idling in their hammocks and many times surprised coveys of naked children, who promptly fled to cover, only to venture out when we got by. Some of the older ones, to be sure, would jump into canoes and paddle toward us, coming close to the stern as we passed so that the wash of the steamer tossed their frail craft up and down most perilously, which adventure they hailed with shrill squeals of delight.

We saw many such huts, and it is from them that the impression often is gained that the whole population of the Amazon valley is made

up of hut dwellers. Such is far from being the fact. On the rising ground, away from the river bank, are some magnificent estates, or *fazendas*, with fine buildings, great herds of cattle and horses, and very considerable plantations. Vast areas of the country are, of course, not only unsettled but unexplored. And these *fazendas*, widely scattered as they are, do not make the showing they deserve.

As we ran close to the shores we were constantly flushing flocks of birds that looked like short tailed pheasants. They were very striking in their brown and red plumage, and as they flew along the



"SERINGUEIRO'S" HUT ON THE AMAZON.

margin of the stream, alighting often and balancing themselves on swaying branches near at hand, it looked as if sportsmen were few. We put them down as Brazilian partridges, but learned later that they were a sort of gilded buzzard, unfit for food, and altogether despicable. It was a disappointment, for all the way to Manáos they persisted, sometimes in flocks of a hundred or more. Of alligators we saw not one. Not that this saurian had disappeared permanently, but the high

water had driven it into the smaller waterways somewhat removed from the river proper.

In the afternoon of the first day, the ship's doctor, net in hand, came to our deck and talked very interestingly of his ambitions as a butterfly hunter. It was his first visit to the tropics and he was gathering everything in the insect line that he could catch. Like a wise man, he had secured the help of the crew, and it was an object lesson, to those who venture up river without mosquito bars, to review a night's accu-



THE BUTTERFLY HUNTER.

mulation. There were enormous beetles, moths, gigantic praying mantis, ichneumon flies, and bugs unclassified by the score. Then in the daytime came the shy, quick moving butterflies in blue, yellow, and green, and thin waisted wasps and hornets, all of which kept him busy.

The course for many years was by Breves, the principal settlement on the island of Marajó, at one time the center of the rubber trade. There the channel was so narrow that an anchor was let go and the boat swung around before it could head right to go on. One of the river pilots, however, once asked permission to take a boat through another channel that he had discovered—the one we were in—and since then the old passage had been abandoned.

Breves is also noted as the first cable station after one leaves Pará. The cable was laid by the Amazon Telegraph Co., Limited, English, under a concession from the Brazilian government granted in 1895. A survey of the river at low water was at once made and the cable laid early in 1896. Between Pará and Manáos there are the following cable stations: Breves, Gurupá, Monte Alegre, Santarem, Obidos, Parantins, and Iticoatiara. There are also some short branch lines, making 16 stations in all. Soon after the installation of the cable some changes in the river bed broke it and for nearly a year it was practically useless. It was, however, repaired and in 1900, 20,000 messages were sent over it, and a



BREVES, ON THE LOWER AMAZON.

year later just double that number. The service as yet cannot be said to be perfect, but interruptions are becoming less and less frequent.

If rubber is high, there are some who claim that the cable is purposely cut to keep the news from reaching Manáos, until certain trades are effected. I only met one man who would acknowledge that he had actually seen the cut ends, and he was not an expert on cable matters, and might not have been able to tell a plain fracture from axe work. My own idea is that the river itself is perfectly competent to supply enough interruptions to suit anybody. Certain it is that one steamer is kept busy nearly all of the time attending to the thousand mile strand that binds the two rubber cities together.

There is also the wireless that proudly lifts its head to heaven at Pará and Santarem. Its brief history is this:

In 1894 certain enterprising Americans organized a company to connect Pará and Manáos by means of a wireless system. According to English papers, secret experiments had been carried on prior to this between Manáos and Iquitos and were most successful. When the concession for its installation was granted, and the equipment began to arrive, what profound thankfulness filled the hearts of the many who were marooned in Manáos, often for a week at a time, hungering and thirsting for news of the outside world. Their hope for freedom, however, from the vexatious tyranny of the great river has so far borne no fruit. Messages were dispatched from either end, but failed to be received. The official explanation, I believe, was that the precipitation was so great as to interrupt them; or was it that there was too much air in the atmosphere? A more probable reason is that the messages sent in the daytime over the rubber forests were gummed up by the flowing latex and fell short of their destination. Nor were night messages any more successful. The big Brazilian fire flies, which are sporty things anyway, got in the habit of racing with the electric sparks and often times beating them. It will be evident to the most shallow thinker that an operator standing on a tower in mosquito ridden Santarem, with a butterfly net in one hand and a receiver in the other, sorting fireflies from flashes, would at times be slightly inaccurate. And accuracy in matters wireless is a prime necessity. So Manáos did not get its relief, and the cable company have an extension of their contract and are laying a second cable in the river bed.

## CHAPTER XII.

JUNGLE STUDY FROM THE CHART DECK—THE SOUTHERN CROSS AS IT REALLY IS—INTO THE AMAZON PROPER—FLOATING ISLANDS—DESTRUCTIVE WORK OF FLOODS—PRAINHA ON THE XINGU—FAST IN A MUL BANK—STEERING BY LIGHTNING FLASHES—ITACOATIARA—THE "DEAD" AND THE "LIVING" RIVERS.

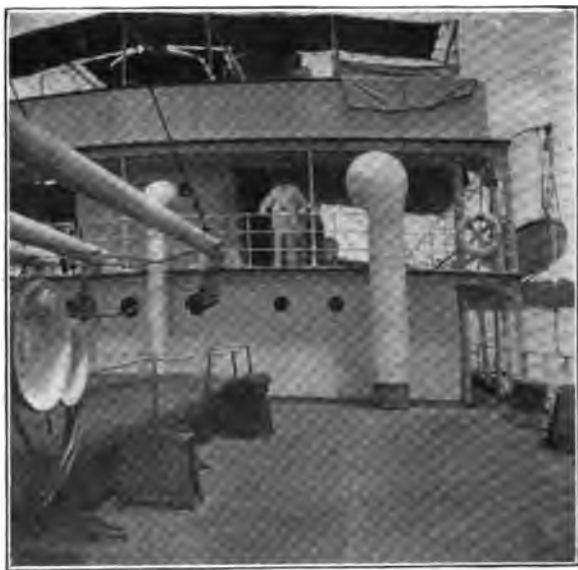
FROM the start we secured the use of a pair of powerful glasses, the property of the Captain, which gave us glimpses into the jungle that were fascinating. We could pick out rubber trees nearly every time, particularly where they had been tapped. I had long been wondering why it was that the *Hevea* was able to withstand the inundations and still be thrifty. A very cursory examination of the Amazonian soil tells the whole story. It is an almost impervious, water-proof clay, which would take months to saturate, and then would not be waterlogged.

That afternoon we ran through an extremely heavy shower and looked back on the biggest, most gorgeous, double rainbow I have ever seen. With nightfall came the great frog concert, varied by the screaming of nightbirds and the chirping of innumerable insects. Sitting on deck, pajama clad, enjoying the gentle breeze caused by the boat's progress, with the dusky loom of the jungle on either side and the "gorgeous Southern Cross" above us, the scene was, in tourists' phrase, "one to inspire sentiments of awe." I always admired this last phrase until I actually saw the Southern Cross. I had read of it as a "blazing aggregation of stars of the first magnitude, holding the center of the Cerulean dome." The "intermediate" geography that I first studied had a half page illuminated picture of it. When finally, after much searching, I saw it, I was filled with awe—at the imagination that could see beauty in that little shrinking, out of plumb collection of blear eyed stars, let alone making a constellation of it. It is an insult to Orion and all of his family.

I do not feel that in the foregoing I have given a clear idea of our course, or what we saw before we emerged into the Amazon. Let me put it briefly.

We went north from Pará, with Oncas island on the left, heading for Point Musqueiro on the mainland, then west and south in the Pará river, passing Caprin light on the southwest. Next came Mandilhy, which also has a light; then through Jaraca channel, with Muru-Muru island on the left, where one out of every three steamers gets stuck in the mud; by the village of Antonio Lemos, where is situated a cable station; past the village of Gurupá by Baxio Grande island, and at last we were in the Amazon.

The river was now three miles wide, instead of a few hundred



THE AUTHOR'S QUARTERS ON THE CHART HOUSE DECK.

yards. The jungle was more open, the clearings larger, and off to the north the eye was delighted by the tree crowned heights of the Sierra Jutahy. One wondered why those broad *mesas* were not the site of a healthy, breeze swept city. We still kept close to the shore, sometimes on one side, then on the other, to avoid great shoals that form and disappear almost overnight. Occasionally there was a break in the forest wall and we would see vast savannahs, grass covered, their light green surface standing out in bold relief against the dark green background of the forest.

Speaking of floating debris, the bow of our boat caught a log which jammed crosswise and held in that position, and we pushed it upstream. It gathered everything that came its way, and the result was that in a couple of hours the sturdy engines were not only forcing the boat upstream, but a floating island a quarter of an acre in extent, made up of logs, driftwood, grasses and floating wreckage of all sorts. After a time it grew to be such a burden that the engines were reversed and we ran backwards until clear of it to avoid making an island that might dam the river.

The banks of the river were now strongly marked and from 6 to



FLOATING GRASS ISLAND ON THE AMAZON.

10 feet high above the water level. On every tree that fringed the edge, and indeed on the thick growing shrubs and vines, could be seen the distinct highwater mark of the previous season in the shape of mud stains. This line showed that the river had still 10 feet more of rise, to reach last year's level, and by the way it was coming up it would undoubtedly do it. More and more we saw the work of the floods. Great stretches of devastated forest, covered with rank reeds and grasses, huge dead trees piled in picturesque confusion upon the river's edge. On a small map the river looks straight and its channel is well defined. In fact it pursues a sinuous course and is everywhere interrupted by



islands big and little, so much so that unless one refers to a chart it is difficult to know when one is really passing the mainland.

We saw many large birds, water turkeys, blue herons, egrets, and thousands of parrots. We passed the confluence of the Xingu river, then the little settlement of Prainha, a town of some 300 inhabitants, its houses painted blue and white with red tiled roofs, its fleet of canoes and its excellent river walls, with buttresses for strength and steps down at the water's edge at each end. Above the town were extensive cornfields and pastures where many horses and cattle were grazing. The current was decidedly swift along there, and we moved up stream slowly. Once fairly by the village we lost touch with mankind, the river



SANTAREM, AND AMERICAN SETTLEMENT.

broadened to about eight miles, and except for the rounded peak of Serra Urubucoara all that we could see was yellow water and great forest covered plains. A great river like the Amazon, subject to floods, always builds banks for itself even if it tears them down again. The larger and heavier materials brought down by the floods are piled on the "near" banks and promptly covered with verdure. For miles we passed banks 10 or 12 feet above the water level and the impression was that the land sloped gently up from them. But when a break came in the forest wall, great meadows would be shown a trifle lower than the river bank, these meadows in turn sloping up into grass lands where cattle fed by the thousands, shoulder deep in the luxuriant growth.

I had heard many say that the journey up the river, except as one

passed through the Narrows, was uninteresting and dreary. My mental picture had been of an expanse of water so broad that the shores dimly seen offered nothing of interest. Perhaps I didn't question the right men. I once knew a man in the gas stove business who visited England in the summer time and all he could describe on his return were the thousands of chimney pots on London dwellings. May be I had taken the view of a chimney pot traveler. Actually, every waking minute disclosed something worth seeing. The river is from 5 to 15 miles wide and the scenery constantly changes. The stories that, for example, in one place it is 900 feet deep, are exaggeration. I followed the charts closely and the greatest depth recorded is 300 odd feet, which of course is good:



OBIDOS, ON THE AMAZON.

The third night out it was very dark and as we worked slowly upstream we saw a winking light far ahead. Soon we learned that the speedy Hamburg-American boat, on which we so nearly took passage, was fast in a mudbank. We solemnly took her mails and went on through the darkness, promising to report her at Manáos. We got to bed late that night because of the excitement, but were up at day light as usual, and found the surface of the river even more thickly littered with logs—logs that were thickly crowded with passengers. There is a little black and white river gull that exists by the million in the upper river. They love to settle on these floating logs and sail and sail. The way they crowd every available inch of space above the water reminds one of a Hudson river boat on a holiday; there is not room for even one more.

During the night it came on very dark with thunder showers but we did not stop, the pilot calmly steering by the flashes of lighting. Very early in the morning we passed the Tapajós river and the town of Santarem. Here is a settlement of some 2,500 people. Santarem is noted, as far as Americans are concerned, as a place where a body of Confederates from Tennessee established themselves after the civil war. They believed in slavery and moved to a country where they could own slaves. Somebody in Brazil must have heard of it, for not long after their establishment slavery there was abolished. Somebody ob-



GATHERING TURTLE EGGS.

serving Santarem from the deck of a passing steamer, quizzing a captain who approved of nothing outside of his far away northern home, wrote of the American colony there as being in a "deplorable condition." That descriptive phrase clung and was copied far and wide. The fact is the descendants of the fighting Tennesseans are a healthy, active, enterprising lot, who own saw mills and cattle ranches and who have the only large rubber plantations on the Amazon. They already have some 80,000 trees and are putting in 40,000 more. They employ Indians and have made a success of that type of labor.

More and more the character of the river bank changed. Often it was a palisade of clay, 10 to 20 feet high, its face as smooth as if cut

with a spade. Near Obidos this was particularly marked. This town, by the way, shows up very well from the water front. Its public buildings, church, and dwelling houses—many of them of the bungalow type—are all in view, as the town is built on a sloping ground. Above the town the river bank is very high, and the clay strata, in lavender, yellow, and red, is very striking. For the first time in the journey our pilot seemed in doubt, and kept the lead going for many hours. Then it was the Captain told us stories about running ashore. It is not particularly dangerous when the river is rising, as one is sure to get off in a few days. He told of one tramp boat that ran aground five times on



ITACOATIARA, OR SERPA.

the journey from Pará to Manáos. His own boat was hung up on a mud bank once for 13 days, and right in a mosquito colony at that. Then there was a Booth boat in the upper river that was fast for six months up on the bank where the floods had left it, and was about to be dismantled when a huge section of the river bank caved in, depositing the boat, right side up, far out in the deep water.

Did I mention that we had some hundreds of crickets aboard, and that they gave nightly concerts? Like the cockroach they ate soiled handkerchiefs, starched collars, and book bindings, but they were not sordid about it. They did stop to fiddle now and then. But the cockroach thinks only of filling his little tin clad belly, and racing across the floor to be stepped on when one is barefooted.

In the upper reaches of the river, at least along the banks, there

seemed to be few rubber trees. This in spite of the statement of the ship's doctor that all of the large ones on the bank were rubber trees—some of the crew had told him so. We did not see the Parintins hills above Obidos, which mark the boundary of the states of Pará and Amazonas, because the rain blotted out most of the landscape. When it ceased we were close in shore opposite a great ranch where were cattle and horses by the hundred. It was imported stock too. One huge snow white Indian bull, standing like a statue in white marble, occupied the foreground until we passed out of sight. More and more we saw clayey palisades, riddled with holes like sand martin's nests, their tops draped with blossoming vines, the body of the bluff often made up of such brilliant colors that it looked like a petrified rainbow. In the little lagoons and eddies were natives fishing, and often times a turtle hunter, bow and arrow in hand, watching the water for a shot. It was growing warmer all the time, for the breeze was with us, and the smoke of the steamer showed it by drifting upstream a little faster than we could go.

We got to Serpa, or Itacoatiara, which is situated at the junction of the Madeira, just at nightfall. Here the engineers of the Madeira-Mamoré railroad have their headquarters, and the town is healthy, lively and interesting. Here also is the home of an American named Stone. He has thousands of acres under cultivation and is prosperous, capable, and as much an American as he was when he settled here 40 years ago.

In due time we reached the junction of the Rio Negro and the Amazon, or the Solimões, as it is here called. The Solimões, yellow, muddy, swift, comes resistlessly in from the south, and, meeting the slow, densely black flood of the Rio Negro, holds it back, shoulders by it, crowds what does escape downstream to the northern bank, where for a time it shows a narrow ribbon of black water and then disappears.

Manáos is situated up the Rio Negro, and we therefore turned into that stream. Crossing the water line it was startling to see how plain the demarkation was. On one side a boiling coffee colored flood, on the other a dead black lake. Occasionally an island of coffee colored water appeared boiling and swirling on the inky surface of the Rio Negro, but of blending there seemed to be none. Such is the contrast between the quiet black Rio Negro and the swirling yellow Amazon that the Indians call the former the "dead river" and the latter the "living river."

## CHAPTER XIII.

ARRIVAL AT MANAOS—FLOATING DOCKS OF THE RIO NEGRO—TRANSPORTATION BY "BONDS"—THE GREAT CITY OF THE WILDERNESS—RUBBER REVENUES.

LEAVING the muddy Amazon, we were soon forging through the black waters of the Rio Negro. On the north were high, red, clay banks, rather scantily clothed with vegetation—that is, as compared with the jungle lands below. Native houses began to multiply and soon we saw the Manáos in the distance. A little later we anchored out in the stream, as several ocean steamers which were discharging at the floating docks took up all of the room. Hardly was the anchor down before friends were aboard who attended to all of the customs formalities, and we walked by the Federal and State customs men just as if they were non-existent, and, embarking upon a launch, were soon ashore.

The great Rubber Congress was in session, or soon to be, and the Commercial Association paid me the compliment of making me its guest, with the privilege of living at a hotel, or at the house of the local representative of "Casa Alden." I chose the latter, for had I not met him in Boston the year before, and was he not an American with an American wife and Yankee baby born in Brazil?

There was much excitement in the rubber market the day of my arrival. The first of the series of spectacular jumps that carried the precious commodity up to \$3 per pound had occurred, and then the river had interrupted the cable. Fortunately there was little rubber in to quarrel over, but everybody was on the *qui vive* just the same.

We walked from the substantial quays that form the boat landing, past the imposing custom house, to one of the rubber warehouses, and sat there and chatted and smoked while we cooled off, for the day happened to be hot. Then we visited several others in the same line and learned the latest news, which was but a repetition of the story already told. The rubber houses in Manáos were almost exact duplicates of those in Pará—a huge warehouse on the ground floor for receiving, examining, and boxing; offices on the floor above, always with a large staff of assistants and clerks. As in Pará, rubber was everywhere in evidence.



BIRD'S EYE VIEW OF MANAOS WATERFRONT.

Open wagons loaded with it passed continually. One enterprising house had a motor truck that crashed along the pavement with just the same awkward energy it would display in New York or London.

Later we took a carriage and drove to the residence where I was to be quartered; a fine modern house in the residential part of the city, where I received royal entertainment and the home cooking for which my soul had been yearning.

We might have taken the "bond" instead of a carriage, but the electricity was weak, and the cars were only crawling as they made their



EXAMINING RUBBER IN MANAOS WAREHOUSE.

rounds. In answer to the reader's unspoken question, an American was the first man to build a stretch of mule tram cars in the capital of what was then the Empire of Brazil, and had the privilege of issuing bonds on the value of his franchise. He was also allowed to sell tickets for passages, wholesale, and these became so handy in commercial operations that they soon formed a fair part of the circulating medium. To these tickets, the name of "bonds" was given, and soon this term became the recognized word for street cars of every tramway system throughout the country.

The street subway line in Manáos was built by Americans—in fact,





MANAOS—BIRD'S EYE VIEW OF THE CITY.

financed by them—and later sold to the government and for a time the service was good. Then one noon the engineer and his helpers had their *siesta* interrupted by the blowing out of a cylinder head on the great engine. *Unfortunately* no one was hurt, the aforementioned public servants escaping. At the time of my arrival new equipment was going in, competent engineers had been engaged and better service was in sight.

After dinner that evening a "Renault" car with a bright yellow body and the muffler wide open drew up in front of the door. It was garrisoned by an expert driver and a friendly young French Brazilian-American interpreter, which car and appendages I learned had been



THE AUTHOR, HIS INTERPRETER, AND THE "RENAULT."

placed at my disposal during my stay in the city. One of the first uses to which I put it was to tour the town.

The city itself is a counterpart of what a young, rich, North American city would be that had grown up overnight. Not architecturally, of course, for the tropical world involves a style of its own, and gorgeous colorings come without bidding and are most fitting. The public buildings were beautiful; particularly the \$2,000,000 theater situated on an eminence in the middle of the city dominating all the rest. Palaces, parks, libraries, hospitals, were very fine. Sandwiched in between them were waste places, old fashioned tiled residences, and much that showed the sudden growth of the city, but all this was being rapidly changed.

When one considers that this city is a thousand miles from the seacoast, in the heart of a vast tropical jungle, with wild Indians within a hundred miles of it, its presence seems incredible. In a way, it is as modern as New York or Chicago. The latest Parisian fashions are there, and almost anything that civilized man desires obtainable. Prices are high, to be sure, because both luxuries and necessities are imported and subject to a duty of 100 per cent. But when something besides rubber is produced by the magnificently fertile lands that surround it, *Manáos* will be one of the great and beautiful cities of the world and living as reasonable as anywhere.

Both the State and the Federal revenues naturally come very largely



TRANSFERRING CASES OF RUBBER BY AERIAL CABLES.

from rubber. These taxes are assessed on the average price at which rubber is sold for a certain period. The Amazonas State tax on rubber is 19 per cent. There are minor taxes on rubber also—for instance, local improvement taxes of 1 to 2 per cent.

The state of Amazonas, in the '80's, passed a law assessing an export tax of \$500 on every rubber plant exported and \$100 on every kilogram of rubber seed exported. It was also forbidden to tap any rubber tree that was not 25 years old, the fine being \$1,000. Furthermore a premium of \$1,000 was offered for each 1,000 rubber trees, planted and cultivated, when they should arrive at the age of two years.

The city has naturally elements of the picturesque. It is built on a group of hills, and while this has involved much cutting and filling, and

many retaining walls, it adds both to its sightliness and healthfulness. Some in Manáos have the ambition, which may not be as wild as it seems at first, to negotiate a short cut to the United States by way of British Guiana. All they would have to do would be to go up the Rio Branco, cross to the Essequibo, and come out at Georgetown, Demerara.

Dominating vast fertile plains, drained by the Rio Negro, the Solimões, and the Madeira, with their mighty tributaries, the wealth that is sure to flow into this center is incalculable. To-day the main export-



THE AUTHOR IN AN AMERICAN HOME, MANAOS.

ing business, rubber and Brazil nuts, is handled by Portuguese, Brazilian, German, English, and American firms, less than 20 in number.

The people of the city had an exceedingly alert carriage—surprisingly so for those who dwelt on the equator. Laborers, whether busy at the docks or in the warehouses, were really working. Perhaps they ought to, for they received somewhere from 15 to 20 milreis a day.

I do not think I spoke of the magnificent spread of the river in front of the city. It forms a great pool, four or five miles wide and deep

enough at low water to accommodate ocean steamers. During the rainy season the river rises from 30 to 40 feet, and this was why the company that had the concession to build docks passed so many sleepless nights. They have finally anchored huge docks a little way off shore, and when the river rises pay out the anchored cables so that the dock rises with it. Goods are sent ashore from these docks on long aerial cables. I was told that it cost 38 cents to transfer each case of rubber from the pier to the deck. Not a long journey, but expensive when one



CUSTOM HOUSE, MANAOS.

considers that that is just about what it would cost to ship the same case from New York to Australia.

The floating dock was built by the Manáos Harbor Co., Limited, a company made up of Brazilian capitalists, English and Brazilian steamship companies, a wealthy English rubber importing company, and others. This company under contract with the Brazilian government built a fine custom house and a quay with an earth backing, the length of the city's water front. The land reclaimed by filling became their property. In addition to this they received, for building the floating dock quays and storehouses, the right to levy tolls for 60 years. The transfer of cargo



FLOATING DOCKS AND AERIAL CABLES.

from the ship's hold to the warehouse is a long step in advance of the ancient method in vogue in Manáos harbor, which involved anchoring in midstream, transferring to barges, loading into carts, unloading at the warehouse, boxing, carting to the pier, loading again into barges and finally into the steamer that took it down river.



ROADWAY TO FLOATING DOCKS.

## CHAPTER XIV.

THE BOSQUE AND EXPERIMENTAL RUBBER PLANTINGS—REAL WILD INDIANS—EXPLORING, UP THE RIO NEGRO—RUBBER AT "PARADIZO" RANCH—DRINKING "CUPUSSU"—THE COMMERCIAL ASSOCIATION RUBBER EXHIBITION—TROPICAL COLDS AND COUGHS—MANAOS MOSQUITOS—ROASTED AMAZONIAN TURTLE—RUBBER TREE-PLANTING DAY.

I WAS pretty busy, for the Rubber Congress was on, and the meetings were exceedingly interesting. As the detailed story of that great convention has already been told, I am going to confine myself to the more personal narrative. For example, the visit of four of us to the Bosque—the very extensive experiment station on the outskirts of the city. We went in carriages as far as we could, then up to the broad plateau where the planting was done. There were some thousands of *Hevea* trees planted in partial shade in paths cut through the jungle. They were doing nicely, and although it will take them a trifle longer to mature, I believe the planting will be most successful. We also examined a large planting of bananas. As this fruit brings 8 milreis a bunch in the field, this experiment also should be successful.

Then we explored, walking through wonderfully beautiful forest paths, down by the old waterworks with its big cement tanks now abandoned, into the great forest park that one of the former governors had projected. Other and more needed improvements had absorbed the city's money, and the jungle was rapidly and effectually recovering its own. Outside of the park we hunted for wild *Heveas*, but found only the *Guyanensis*. There was also a vine which we could not identify, full of very sticky, rubbery latex.

In Manáos the laborers are practically of the same type as in Pará, except that the Indian mixture seems a little more evident. One is nearer the great wild tribes of the upper rivers, so that the blowgun with its poisoned arrows, necklaces of human teeth, and feather headdresses are often brought in. Occasionally, too, specimens of the real wild Indian may be seen. A young Englishman whom I met had spent some months up in the Putamayo district and brought down with him a nine year old boy as body servant who was a veritable little savage. Friendly



WATERWORKS, MANAOS.



THEATRO AMAZONAS, MANAOS.



and smiling he was when all went right, a murderous little tiger if things went wrong. He would accept reproof from his master but from no one else. One day a man servant struck him and his master returned two hours later to find the boy sitting in the courtyard, a loaded Winchester across his knees, and all the servants hidden in a hastily barricaded room from which they dared not emerge. Had the offender shown himself the boy would certainly have shot him.

The president of the Commercial Association, although he bore a German name, was not phlegmatic. Indeed, he had abjured Teutonia and was a Brazilian of the Brazilians. Athlete, sportsman, *bon vivant*,



RIVER EXCURSION NEAR MANAOS.

business man, he defied climate and care, was always on the move, and kept others moving also. It was he who chartered the *Suprema*, a typical little river steamer, and took a few of us up to the Rio Negro for a day's jaunt.

The "black river" for miles and miles up into the interior is nothing less than a chain of great lakes, and my host unfolded a weird scheme for navigating it by means of boat aeroplanes, which, like gigantic flying fish, should skip from one lake to another. He made it appear quite feasible, and if such a thing is ever done he will be just the one to furnish the courage and dash to put it through.

Our first pleasurable experience on this voyage was breakfast served on an ingenious table, which, when not in use, folded its legs, rose to the ceiling, and hung high above our heads. The meal was excellent—a freshly caught river fish, the *pescadas*, a wonderful salad, fruit and coffee.

Out of sight and sound of the city the solitude was oppressive. It may have been that the jungle covered shores had lost their charm or—and this is more likely—it may have been the total absence of bird and animal life for which the Rio Negro is noted.

Soon we entered an estuary and after an hour or more of steady steaming sighted a clearing that indicated our near approach to "Paradizo"



VIEW ON THE RIO NEGRO NEAR MANAOS.

ranch. Hardly had we got ashore before we saw rubber trees, and many of them. Much to my surprise they were planted in regular rows and were big, young, and lusty. I had heard only the day before, from one well versed in rubber, that the *Hevea Brasiliensis* would not grow up the Negro. Yet here it was. This planting, although 20 feet above the water as it then stood, was subject to inundations and apparently suffered no harm, while further up the slope were trees equally large and healthy that were above high water mark. The Botanist of our party soon discovered a borer beetle that was industriously puncturing many of the trees, and we fell to and helped him to coax *larvæ* out of their holes for later entomological examination. If I know anything about that Botanist,

and I think I do, he will make that particular breed of beetle sorry that it ever tackled rubber trees.

Later we visited the comfortable ranch houses, saw them make *cassava*, admired the beautiful flower gardens, filled our pockets with *Hevea* nuts, and turned toward our boat and Manáos. It was on this excursion that we tried *cupussu*, a drink made from a creamy, pulpy fruit that is deliciously refreshing. The proper way to imbibe it is to slowly sip a goblet of it, then swallow half a pint of gin to head off the



PLANTATION HOUSE ON RIO NEGRO.

cramps, then a cup of black coffee to head off the gin. One of our party who despised gin and did not care for coffee was the busiest man in all Brazil for 24 hours after finishing his goblet.

Perhaps the most interesting of the sights in Manáos was the double exhibition of Amazonian products. I call it double because there was first a rubber exhibition arranged by the Commercial Association for those attending the Congress, and in the same building a varied collection of native products that were to go to a European world's fair. In the

former were specimens of fine and coarse Pará rubber, of caucho, and a great *pelle* of rather sticky rubber from the *Hevea Guyanensis*. One enterprising and wealthy *seringueiro* had prepared block, crepe, and pancake rubber after the fashion of the preparation in the Far East, and it certainly was as good as any plantation rubber in the world. There were also gathered and shown all of the tapping and coagulating tools and utensils used in Brazilian rubber gathering.

What the country had done agriculturally and industrially was shown in the wonderful exhibits of cereals, textiles, coffee, cacao, and woods



RIO NEGRO "PELLE" OR RUBBER BALL OF 700 KILOGRAMS. AT MANAOS EXHIBITION.

of all degrees of hardness, beauty of polish and variety of grain. There was also ornate feather work, gorgeous native embroideries, and wonderful hammocks.

These exhibitions were opened by the Governor in person, and all came in frock coats and tall hats. As each visitor entered the door, the Police Band, which was lying in wait in an alcove, burst forth with a brazen crash of welcome, while the newcomer, trying to look dignified and free from self consciousness, wobbled through the vestibule and lost himself in the crowd where he could watch the next fellow do the same thing.

I did not find the heat too oppressive. It got up in the 90's some-

times, and there was the usual fight against mildew, which proved it to be somewhat damp. Mine Host, his wife, and the baby all came down with severe colds while I was there, which I believe was wholly due to the dampness. I do not expect to make Manáos my permanent residence, although one might do worse, but if I do, my sleeping quarters will be on the second floor and not on the ground floor, for that is where one takes cold, and a cold once taken in the tropics is as hard to cure as a sprained disposition.

Another thing, every window and door in my house should have screens, even if none other in the city followed suit. The yellow fever



MACHINE FOR SMOKING LATEX.  
(Earthen smoking cone on the extreme right.)

mosquito is a city dweller, and if he was driven out of Panama by screening and a little sanitation, he can be out of Manáos. The government is alive to it, but the people, foreigners and all, seem indifferent. While I was there the *Inspector Sanitario* sent out a circular illustrated with pictures of mosquitos, which was passed from house to house. It was, however, in Portuguese, and I was unable to decide whether the *Culex*, kneeling in prayerful attitude, or the *Anopheles*, standing on its head as if about to turn a joyful somersault, was the one to avoid.

At first I kept close tabs on the death rate in the daily papers through

my Companion. I showed him the Portuguese word for fever, and his statistics grew larger day by day. Finally I discovered that he believed that *Fevereiro* (February) meant fever. Therefore, if it happened to



RUBBER TREE PLANTED BY THE AUTHOR IN MANAOS.

be the 20th of the month, dispatches of the day before would appear throughout the paper "*Fevereiro 19.*" Adding them up he got a daily death rate of something like 350 and sure to increase to the end of the

month. It speaks much for his self poise that he was not at all startled, even if I was.

One of my early visits was to the Governor, who impressed me as most anxious to give his State a capable, businesslike administration. I attended all of the functions that made up that notable week from the



CHURCH OF ST. SEBASTIAN, MANAOS.

laying of the corner stone of the new brewery to my own lectures in the *Theatro Amazonas*. I enjoyed official breakfasts, private dinners, and "sing songs." But of all the meals, some of which were magnificently served, none tickles the palate of my memory like the turtle roasted in the shell with *farinha* that my hostess prepared for me. It was in-

describably delicious. At last I could comprehend how an Indian could stand day after day in a cranky canoe, in the broiling sun, on the off chance of shooting an arrow up into the sky, that it might drop, impale, and secure this most delicious of crustaceans.

It was my suggestion, and I am proud of it, that got the Governor, his staff, and a dignified committee out of their beds very early one morning to plant *Hevea* rubber trees in one of the public parks. It seemed as if in that great city some one ought to know how the tree looked that produced its wealth. Yet few of the business men could tell me whether the leaves of the *Hevea Brasiliensis* grew in clusters of three or thirty-three. So I suggested city planting and they assented with enthusiasm.

The Governor planted his tree, the President of the Association his, I planted mine, then came Dr. Huber, with many others, and we sprinkled that beautiful park with thrifty seedlings that, according to latest advices, "are doing well."



## CHAPTER XV.

STEAMERS OF THE AMAZON—INTERESTING BITS OF HISTORY—MAIL DELIVERY ON THE UPPER RIVERS—THE "ASSOCIACAO COMMERCIAL DO AMAZONS"—"BORRACHA"—THE LAND OF "POCO POCO"—FOOTPRINTS OF VISITING AMERICANS—NINE DOLLAR HEAD TAX—OFF FOR THE SOLIOMOES.

**M**ANÁOS has direct sailings for the United States and Europe, and a great fleet of steamers, big and little, that go to all the upper rivers, even to the slopes of the Andes.

The carrying trade of the Amazon is done, first, by ocean going boats of such lines as the Booth, Hamburg-American, and Lloyd Brasileiro, many of which visit Pará and Manáos only, while others go a thousand miles further up to Iquitos; second, by a fleet of river steamers, several hundred in number, that belong some to individuals and some to companies. The Amazon Steam Navigation Co., Limited, for example, the oldest, has about forty steamers and many tugs and lighters. Their boats are from 150 to 800 tons burden, and the company is subsidized by both State and Federal governments to run regularly up some of the great tributaries of the Amazon.

Time was when the flat bottomed stern-wheel Mississippi type of steamer was very generally used, but it has practically disappeared. The twin screw steamer is to day the usual thing—that is, for the better class of river boats. Some of these are fitted with electric fans, ice machines and excellent accommodations for first class passengers. The boats are usually two deckers, both being open. The lower deck is for the engine, cargo, animals, crew, and third class passengers. This deck is usually loaded in layers—merchandise, mules and dogs at the bottom, passengers in hammocks just above, with an animated top layer of parrots, monkeys, and insects. The upper deck, reserved for officers and first class passengers, has a few four bunk cabins and a long table aft where meals are served, and is very comfortable.

The real beginning of steam-navigation on the Amazon was in 1853, when a Brazilian company ran regular steamers between Pará and Manáos. In 1866 Brazil declared the Amazon a free waterway. This, however, does not mean the river all the way up to Iquitos, nor does it

include the great tributaries. It means the Amazon from the Atlantic up to where the Rio Negro enters it, 900 odd miles away. Thus under a strict ruling, Manáos, which is five miles up on the Rio Negro, and the settlements on the Solimoes up to Iquitos, would be deprived of this boon. The result is that the great affluents of the Amazon are navigated only by vessels that sail under the Brazilian flag, except under special treaty.

Several Brazilian companies started soon after this, but their existence was brief and they sold their steamers to private firms. In 1872 the Amazon Steam Navigation Co., Limited, was registered and equipped especially for work on the Amazon. This consisted mainly in handling



PALACE OF JUSTICE, MANAOS.

freights and passengers between Pará and Manáos. By means of subsidies and special concessions, however, they were induced to extend the service to most of the important affluents of the Amazon. For example, they were allowed to raise freight rates 25 per cent. and passenger tariffs 30 per cent. In return for this they agreed to run more boats on the Madeira and Purús and to establish a monthly service on the Araguay river.

Of the hundreds of steamers privately owned no two are exactly alike. All types of engines are represented, and of propellers one would not believe that so many patterns had ever been made—a great handicap in repairing. These boats do not pretend to run on schedule time. They leave when they get ready, go where they choose, and arrive when they

can. The result is a great deal of wasted effort. It often happens, on the main river or some of the great tributaries, that a party expecting the boat will wait for days and finally go back in disgust to their *seringal*. Then a week or more later the boat arrives and sends out an expedition to find the *seringal* and secure its freight.

According to Brazilian law any and every boat navigating their waters must carry mail if requested to do so, and that, without recompense. A wise old Portuguese sea captain described to me the mail carrying of some of these smaller boats that went far into the interior. Not being paid for the service the owners were resentful, and sometimes



COMMERCIAL ASSOCIATION BUILDING, MANAOS.

when away from the restraints of civilization the mail bags were viciously dumped overboard. At other times they were completely forgotten, and after months of journeying were brought back and delivered to the postoffice from which they started.

Of great importance to city and state is the *Associação Commercial do Amazonas*. Every business house in Manáos, of any prominence—Brazilian, Portuguese, English, German, and American—is represented in this Association. Nor is this all; business interests throughout the state of Amazonas, particularly in the upper Amazon, are also members. It is really a State Board of Trade, active, progressive and comprehensive, and vital.



JARDIM DA PRAÇA GENERAL OSORIO, MANAOS.



"VICTORIA REGIA" IN ESTUARY OF THE AMAZON.

Organized 35 years ago, its history has been marked by varying degrees of activity, but it has stimulated cöoperation in the direction of the general welfare of the city and state. Its work has been much broadened since its reorganization under the new statutes of May 28, 1908.

The visitor to the Amazon country, whatever tongue he may speak, soon learns some Portuguese. One word in particular impresses itself upon him from the beginning, that is *borracha*. He hears it in the streets of the cities, on the river steamers, in the jungle, and soon learns that it means "rubber." Like all people of Latin extraction, the Brazilians



JARDIM DA PRACA DA CONSTITUCAO, MANAOS.

are very apt in coining expressive phrases. They often call india-rubber *ouro preto* (black gold), a fascinating term, perfect in its complete suggestiveness.

Some people at Manáos are still wrathful over an article published in a New York daily back in 1907, entitled "Peter Panning in the Land of Poco Poco." It was an alleged interview with Casper Whitney, illustrated by reproductions of photographs, such as all tourists may purchase anywhere in Brazil. One of these was labeled "Indian of the Upper Amazon Never Before Seen by White Man." Another pictured Indians found only in the Argentine republic, some 2,000 miles from the region in which "Peter Pan" was "pocopocoin." By keeping the canoe close in shore he fortunately slipped by without attracting the attention of these savages!

He went cautiously up the Amazon as far as Rio Negro, where he found that "steamboat navigation ceases." Here he took to canoe, paddled past Manáos, with its waterfront crowded with buildings and its huge floating docks, passing through the fleets of ocean going steamers that crowd the river basin even to midstream, and saw only jungle covered shores and watery wastes never before trodden by the foot of white man. From danger to danger, from little jeopardy to great jeopardy, he advanced up to the Casiquiare river. His adventures were marvelous.



STAFF HOUSE, FOR AMERICAN CLERKS, MANAOS.

He fought his way through schools of crocodiles that slew natives right and left; slept in trees while cannibals held orgies on the ground beneath, and at last—worn, ragged, half starved, but with unfaltering imagination—he came down the Orinoco, never before seen by white man, and was safe.

Peter need not go so far afield for material. A little "panning" nearer home would surely get color. Why not offer his daily story on "Jigging for Giraffes in Jersey City," and be back in the hall bedroom before dark?

A city so far removed from New York as Manáos is an ideal reflector of the sort of permanent impression a foreign visitor leaves behind him. It is usually some particular idiosyncrasy, mannerism, or fad that is held in remembrance. Thus, for example, Manáos remembered a speculative rubber promoter as possessing a very broad, tooth showing smile; a millionaire yachtsman and Wall Street magnate as a good natured "prince of perspiration"; a New York city official, once in rubber, as dictating to three stenographers at once (why didn't he hire one good one?), and so on.

Perhaps the one whom they remembered best, and with surprised awe, was a certain boyish American, who appeared on the *avenida*, coatless, vestless—the only man in Manáos without belt or sash, his trousers held up by good, old-fashioned "galluses." This youngster crossed the Andes, bought rubber, came down the Madeira and got it through to New York at a profit. Not only that, but he engaged to build a Madeira-Mamoré railway. Others got concessions to be sure, and he did not, but it was not owing to his lack of ambition.

When the time came for our departure from Manáos, the steamboat company allowed us to go down on a cargo boat. At first the officials strongly advised our waiting for a week for one of the regular passenger boats, picturing the discomforts of a vessel not fitted for passengers, but finally capitulated.

One very interesting formality that we were obliged to go through before leaving Manáos was the payment of a head tax amounting to \$9 for permission to leave the country. I tried to get the official to make it \$8.98, but got not the slightest encouragement. I was further obliged to deposit with the steamship company \$50 to be turned over to the hospital board in Barbados for care or funeral expenses in case I arrived at that careful island with yellow fever.

Early on Sunday morning, therefore, we said our good byes and made our way down to the pier, where a delegation from the Commercial Association was waiting to bid us *bon voyage*. We all shook hands and said nice things to each other; the president gave me a beautiful spray of orchids, the *Catalaya superba*, and with a final adieu we went aboard. Shortly after, the boat started down the river. Our last glimpse of Manáos as we steamed away was the huge dome of the theater, its rich blending of red, blue, yellow, and green tiling blazing in the sunlight like a gigantic fire opal. We passed by the red clay shores, and at length out of the black water of the Rio Negro into the yellow Amazon again.

## CHAPTER XVI.

RAILROAD BUILDING IN THE HEART OF THE RUBBER COUNTRY—THE CATARACTS OF THE MADEIRA—"BATELAOS"—MADEIRA-MAMORÉ CONCESSION—THE GREAT CAMP AT PORTO VELHO—CARIPUNA INDIANS.

I HAVE already mentioned the great number of workers, engineers and others, whom we met going and coming from the headquarters of the Madeira-Mamoré railway, but it was not until I got to Manáos that I really appreciated what a great undertaking it was, and how energetically it was handled. One of the partners in the contracting firm that was putting the road through resided there, and I got to know him well. His official headquarters were at Manáos. But Itacoatiara, at the mouth of the Madeira river, was the place where supplies were stored, and many of the men housed going and coming from the railroad camps.

The Madeira, it will be remembered, is the Amazon's greatest tributary. It comes from Bolivia and furnishes about the only outlet for that landlocked republic. From where it enters the Amazon to San Antonio, nearly 500 miles away, it is navigable by ocean steamers. Then come 250 miles of rapids, in which there are nineteen cataracts. When the water is high, the big rubber *batelões* are able to get through by floating part of the way and making portages around the falls, but shooting the rapids. These portages are furnished with narrow gauge tracks. The *batelões* are unloaded, pulled upon a small truck, and dragged up over the hills, and then eased down on the other side. The return trip involves 25 portages, and three trips a year are all that is possible. The enormous effort required in moving these heavy boats can hardly be imagined. Every season at low water new roadways must be made by clearing the great boulders out of the river bed, and then laying a corduroy road of green poles, over which the keels of the *batelões* can slip. Where it is possible they use block and tackle to help in pulling, but sometimes everything must be done by main strength.

There is a loss of 10 to 15 per cent. of the rubber sent down by the upsetting of the scows. Not only that but many men are drowned. The *batelões*, by the way are flat bottomed scows 30 feet long and 8 feet





SAN ANTONIO, HEAD OF STEAM NAVIGATION ON THE MADEIRA RIVER.

wide, and carry about 10 tons of rubber. They are manned by 16 paddlers, or *bateleiros*, and usually make the journey down in 20 days, while it takes 60 to return. Transportation difficulties particularly where there are cataracts as there are in the Madeira, are very great. For example, the journey from Pará to the Beni river took a trifle more than 200 days. The return trip down stream took 70 days. Freight rates going up were from \$800 to \$1,200 per ton, and for the down trip from \$300 to \$350 per ton.

It is commonly believed that because of the marvelous waterways



HAULING RUBBER BOAT AROUND THE FALLS OF THE MADEIRA, OLD REGIME.

possessed by northern Brazil, railroads are neither necessary nor likely to be built. Time was when it was thought that the Mississippi and its tributaries would be all that the Middle West would ever need for transportation. To-day those waterways and half a dozen great railroads are often unable to handle the merchandise offered them. History will undoubtedly repeat itself in Brazil. Railways from the great province of Matto Grosso will carry rubber and other products south and east, opening up an enormous territory. Running northward from the



FALLS AND RAPIDS ON THE MADEIRA RIVER.



CONSTRUCTION CAMP, MADEIRA-MAMORE RAILWAY.

heart of Matto Grosso to the beginning of navigation in such rivers as the Tapajós and the Araguay, perhaps joining the upper end of the Madeira-Mamoré, they would open up a country of inexhaustible wealth. The day will come, too, when Manáos will be connected with the Guianas, certainly by wireless and almost as certainly by railroad.

Brazil already has a fine railroad system but it is almost all in the south. The Madeira-Mamoré railroad is the precursor of a great number of roads that will undoubtedly be projected to open up the vast country of the Amazon valley. The concession for the building of the



CONSTRUCTION WORK IN PROGRESS.

Madeira-Mamoré railway was granted to a Brazilian in 1906 and at once transferred to the Madeira-Mamoré Railway Co., a corporation organized in the United States. This company was financed by the Brazil Railway Co., and a company known as the Port of Pará, both American, each owning 50 per cent. of the stock of the Madeira-Mamoré railroad.

The Madeira-Mamoré road will be 210 miles long and will open up 2,500 miles of navigable waters in Bolivia, the Acre, and a part of Matto Grosso. In June, 1910, 55 miles from Porto Velho to Jaci-Parana were open for traffic. The road has since been extended to the river Mutum-



CAMP HOSPITAL FOR LABORERS, MADEIRA-MAMORE RAILWAY.



ROCK CUT ON RAILWAY LINE.

Parana, about 100 miles further, and one train a week is run for freight. As the charges have been about \$300 per ton down the Madeira and \$400 per ton going up, the railroad can cut these rates in half and still make money. It has been estimated that the annual transportation charges over the Falls were about \$2,500,000.

The headquarters of the construction camp was not at San Antonio, but at Porto Velho, where were assembled from 4,000 to 5,000 men. Of these 300 to 400 were Americans. Here were built substantial quarters for the engineers, bunk houses for the men, an up to date thoroughly



A BAD LANDSLIDE ON THE RAILWAY.

equipped hospital, an ice plant, and large storehouses. The company had also drilled wells for water, and was making every effort to keep the men well. In spite of that, there were sometimes nearly 300 men in the hospital and seven to ten doctors and eight male nurses were constantly employed. The experiment of having female nurses was tried, but they were married and carried away so constantly that it was voted a failure.

The camp was under military discipline, and liquor was taboo. In spite of this the native laborers smuggled in more or less *cachaca*. The most troublesome diseases were *beriberi*, blackwater fever, and dys-

entery. Quinine, of course, was the remedy generally used and most potent. It was bought by the ton, and three laboratory men were kept busy from morning until night making it up into pills.

The town was noted as publishing the only English paper on the Amazon, called *The Porto Velho Times*. The first issue appeared on typewritten sheets. Then the company sent in a font of type and a printing press, and the paper appeared with more or less regularity. It was a remarkable looking sheet typographically. There were no "w's" in the font, and two "v's" placed close together were the alternative. The



TRACK LAID, MADEIRA-MAMORE RAILWAY.

paper was full of camp news and genuine fun, and everybody subscribed. Under the general announcements of the paper's scope and policy appeared the subscription price, which was—

Six months, nothing.

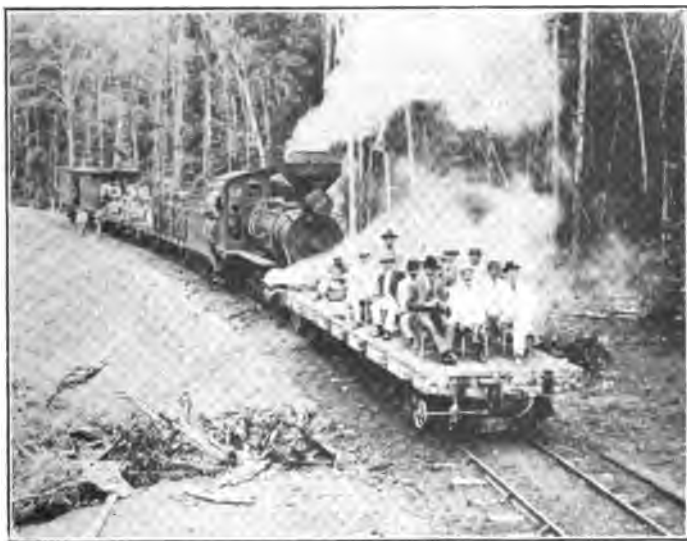
Three months, half price.

The name of the paper has since been changed to *The Porto Velho Marconigram*.

The railroad workers were only in this camp at stated seasons. Some of them were far ahead with the preliminary party of engineers, who were deciding upon the location, or they might be nearer the camp on



MAKING QUININE CAPSULES IN THE HOSPITAL.



CONSTRUCTION TRAIN, MADEIRA-MAMORE RAILWAY.



construction. The company paid the men on the 10th of every month, and five men were in the employ of the pay office to prepare the \$175,000 that the paymaster carried in person to the various camps.

All of the men were obliged to sign a contract to pay no court to the



CARIPUNA INDIANS AND BARK BOAT.

Caripuna Indian women, nor sell firearms to the men. If this contract was violated they were discharged without pay. The result of this wise policy was that the Indians were very friendly, and furnished the camps with many turtles and lots of fish.

## CHAPTER XVII.

RUBBER MANUFACTURE BY INDIANS—HEAD HUNTERS—REBELLION OF CONTRACT LABORERS—INSECTS IN THE RAILROAD CAMPS—EARLY ATTEMPTS AT RAILROAD BUILDING—THE MAMORE, BENI AND THE MADRE DE DIOS—CANNIBAL INDIANS.

IT would be strange in a rubber country if there were not some rubber manufacture. And there is much. Nearly all of the Indian tribes make rubber ponchos, kit bags, and some very curious toys. In making a rubber bag, they first make a bag of fabric, sometimes of prettily flowered calico, which they stretch over a frame until the surfaces are smooth and taut. Then they take caucho milk, never using *Hevea*, and stir into it powdered sulphur, the proportion being a tablespoonful of sulphur to each liter of latex. After stirring the liquid thoroughly, they apply it to the cloth with a feather and give it a sun cure. If sulphur is not obtainable they use gunpowder. When the sulphur compound is spread over flowered calico the colors show through and the bags are extremely pretty. The gunpowder mixture, of course, is black and not transparent.

These bags will outlast a dozen made of vulcanized rubber and are eagerly purchased by engineers and prospectors.

A great many other useful articles are made, such as cigar cases, tobacco pouches, and ammunition bags, and even rubber shoes. Of course the latter are not made for export. Occasionally a native makes a clay last, puts thirty or forty coats of latex over it, with additional coats for the sole and heel. Then a couple of days later he draws ornamental designs with a knife or a piece of wire, allows the shoes to stand a week to dry out and then they are finished.

Some of the Indians on the upper Amazon made wonderful feather ornaments. Notably headdresses of the most brilliant feathers, and although the height of the crown was  $3\frac{1}{2}$  feet it was exceedingly light and was as easy to wear as a pith helmet. If made at all at the present time it is only by tribes far in the interior of the Upriver country. A lost art among the Indians far up the Amazon is the preparation of human heads in miniature. These heads, of which numbers are still

to be found in museums, are about the size of an orange, with the features almost perfectly preserved, and the long black hair intact. The process consisted in carefully extracting the bones of the skull, bit by bit, tanning and shrinkage the cartilage and finally the wearing of the head at the waist by means of a cord threaded through the lips, in the fashion that the North American Indians wore scalps.

The railroad company shipped in beef on its own steamers from



INDIAN COATING CALICO BAG WITH RUBBER MILK.

Manáos, and furnished such delicacies as Boston baked beans and rice *ad libitum*.

The day laborers were a mixed lot gathered from all parts of the world. An unfortunate experiment on the part of a German contractor took place while I was there. He brought in 600 laborers from Germany, mostly Polish Jews, and agreed to pay them 60 cents per cubic yard for digging dirt. He was to get \$1 a yard for it, and pocket the

difference. The workmen in a few days after they were located discovered that other gangs were getting \$1. They promptly struck and walked 80 kilometers back to camp. The camp manager, when he heard the whole story, promised to cancel the contract and give them \$1 per yard. This they refused. He then offered to put them at work on



RUBBER ARTICLES MADE BY INDIANS ON UPPER RIVERS.

buildings and other jobs. This they also refused. He then offered them free transportation back to Manáos, but again met stubborn refusal. He was finally forced to disarm them and drive them from camp. They then built rafts and started to float down to Manáos. Many of them died and the residue were picked up by a river steamer and taken to Manáos and placed in charge of the German consul. As I was leaving,

the German government was getting busy with the idea of seeking redress.

Perhaps the greatest curse in this upper country is insects. There were flies innumerable, together with *moyaquils* (called "bachoburna" there), chiggers, ticks, flies, and mosquitos by the million.



INDIAN HEAD DRESSES.

The railroad company established wireless stations at Manáos and Porto Velho, which worked perfectly from the start. Later they planned to have another station at Villa Bella, at the farther end of the

road. It is quite possible, once these are installed, that they can communicate with Bolivian wireless stations, which would give Manáos another means of sending messages to the outside world.

The engineers go with the company under contract for a period of



HUMAN HEADS, SHRUNKEN, USED AS INDIAN WAR TROPHIES.

two years, with a three months' vacation, which they usually spend in a trip to the United States. They are very well paid, as a class, and those who are suited to the life really enjoy it. I met two whom I had previously known in Panama. They were on their way to the States for

their vacation. One was in perfect health; the other had chills and fever at regular intervals, but was filling up on quinine, and had no thought but to return when his vacation was over. They had many interesting and unusual stories to tell of happenings up in the wilderness. One of them told of the possessor of an honored English name who was compelled to drop it and take another. It came about in this way. Whenever a companion called him by his surname, it was greeted with shrieks of laughter on the part of the natives. Not only that, but if he met a native on the trail, the latter would speak his name and then



AN INDIAN SLING SHOT.

go into convulsions of merriment. When he learned that his patronymic was a native word which meant the concrete and ultimate result of a strong cathartic pill, he promptly called himself "Smith."

The story of the earlier efforts to build railroads around the Falls of the Madeira is wonderfully interesting and singularly romantic. The first real attempt was made some forty years ago, under a concession to the Bolivian Steam Navigation Co., the contractors being an American concern. The whole scheme originated in the enterprise of Colonel George Earl Church, a noted American civil engineer, who proved to both the Bolivian and Brazilian governments the necessity

for such a road. The Collins company made a survey, sent in much equipment, and had laid about five miles of track when the English bondholders got frightened, put an injunction on the funds of the company, and after much litigation got the money and the Collins company got nothing. The American loss was something like \$500,000. The Brazilian government later put through a new survey, but were not ready to finance the proposition at that time. Then came the Acre dis-



MOSQUITO PROOF HEADGEAR USED BY ENGINEERS IN BRAZILIAN FORESTS.

pute and the cession of that rich rubber territory to Brazil, with the agreement that the railroad should be built at once.

According to common gossip in Brazil, the American engineering company who are putting it through agree to have it completed in three years' time. The Brazilian government pays all of the bills and the construction company gets 10 per cent. of the money expended for its trouble. The road is narrow guage and many of the bridges now of timber construction will be replaced later with solid masonry.

Except in the towns very few traces of the Collins enterprise remain.



The roadbed, rails, and all had absolutely disappeared, and only impenetrable jungle was to be found where once ran the pioneer Madeira-Mamoré railroad.

The Madeira river, above the falls, is fed by several great rivers that drain an immense territory which is rich in rubber. There is, for example, the Guaporé that drains both Bolivia and Brazil, rising far up in Matto Grosso; the Mamoré, the Beni, and the Madre de Dios—all great rivers, together with hundreds of lesser. This upper country has many thousands of miles of navigable streams at the time of high water, and once the railroad is finished, hides, cinchona, and a great



STEAMER AT PORTO VELHO, MADEIRA-MAMORE RAILWAY.

variety of other products, as well as rubber, will find their way out through the Amazon.

Pioneers in the upper Amazon country whether they were explorers, railroad surveyors or rubber gatherers, have in the past been very much harassed by some of the wild Indian tribes. For example: "The cannibal Tauapery Indians often attacked, killed and ate rubber gatherers, saving the right leg as a trophy." Then too, the Acarinus Indians, on the Rio Pauhin, were said to attack rubber collectors, carrying away their heads as trophies. From the upper Tocantins came often reports of Itacayuna Indians, a very primitive tribe, unacquainted with the use of iron, who made huts of woven twigs and branches, "broken with their teeth."

Whether they killed the rubber gatherers with the same weapons, does not appear.

There are many small and exceedingly warlike tribes scattered through the Amazon basin that have at times wiped out settlements of rubber gatherers. That any of them are cannibals, however, is yet to be proved. Furthermore the owners of the *seringaes* exact a heavy penalty for massacres and the reports of killing are becoming less and less fre-



RELIC OF THE FIRST ATTEMPT AT RAILROAD BUILDING ON THE MADEIRA.

quent. To-day there are really no unmixed wild tribes of Indians on the lower Amazon or its navigable branches. There were many such but they have become extinct. It must be remembered that there are great tracts of land in the Amazon country where there are no Indians at all. The remaining wild tribes, as a rule, live back in the forests above the limits of navigation. It is claimed that there are about 250,000 Indians in the Amazon basin, and whether wild or Christianized, they have the same civil rights as the whites.

## CHAPTER XVIII.

THE BOLIVIAN MONTANA—DISCOVERY OF RUBBER THERE—"OURO VEGETAL"—ESTABLISHING "SERINGAES"—CARTRoads—LIBERAL LAWS PASSED—"BORDER RUFFIANS"—HOW BOLIVIAN RUBBER IS GATHERED—RIVER NAVIGATION BY "BALSA" AND "CALLAPO"—A RICH RUBBER CHIEFTAIN.

**T**O-DAY one third of the world's supply from South America of fine Pará rubber comes from Bolivia and the Acre. The discovery of rubber in the Bolivian *Montana* dates back to 1869, when two Bolivians obtained specimens and sent them to Europe, the report being that the gum was of the best quality. As a result of this a few started gathering at Cavinás, 100 to 150 pounds at a time, rowing up stream 200 miles, then transporting it across country 60 miles and sending it down over the Falls of Madeira. Bolivian rubber did not appear on the market, however, until 1893, when the grade known as "Mollendo" began to be shipped from the Pacific port of that name.

Dating back to 1827 there had been the report of cannibals on the Beni river, and the region was so dangerous that it was considered fatal to any one penetrating its murky forests. Political criminals were therefore sent there in lieu of sentence of death. In 1880 an American traveled overland from the Pacific with a few rubber gatherers in his train. He failed to locate any cannibals, and in four months had 600 gatherers at work. An adventurous French baron, accompanied by leading American importers, further explored the river in 1893. As a result of this, a company was formed for exploiting the resources of the Beni, but nothing was accomplished. In the meantime it became widely known that the Beni country was rich in rubber, cinchona, and precious metals. It was also proved that the Indian residents were not only harmless but very friendly.

Interest in rubber continued to increase, steam launches were put on the Beni, Madre de Dios and Mamoré, and transportation either toward the Falls of Madeira or up the Purús toward the mountains was made much easier. For example, in 1891, 35,000 quintals of rubber, carried by donkeys, mules and llamas, went over the Andes. It was then planned



NAVIGATION ON THE UPPER RIVERS.

to avoid the Falls of Madeira by a canal connecting the Beni and the Purús.

At this time the population, exclusive of wild Indians, was recorded as 22,000. Bolivian rubber was considered so valuable that it was called *ouro vegetal* (plant of gold).



SORATA, BOLIVIA.



BRIDGE BUILT OF RAILROAD RAILS.

The ubiquitous Hebrew peddler early penetrated to this part of the world and got full value for his wares. One of them, supposing that the natives would be great gamblers, took in many packs of playing cards, but found no sale for them until he segregated the face cards and sold them at a high price as likenesses of the saints.

Numbers of great *seringacs* were early formed—one for example,



A LEVEL STRETCH ON THE MADEIRA.



A "BALSA" TRANSPORTING RUBBER.

on the Orton river, with 1,000 rubber gatherers and equipped with everything to do the business comfortably and economically.

The Bolivian rubber was acknowledged to be of the very highest



WEIGHING "CAUCHO," BOLIVIA.

grade and ran 86 per cent. fine. The government export tax upon it is 14 per cent.

The Bolivian government acted very wisely in dealing with *concessionaires*, foreign and native, and in guarding their rights and rights of laborers. It passed laws regulating the concessions, allowing anyone to explore for rubber trees.

Concessions were granted by *estradas*; no individual being allowed to own more than 500, and no corporation more than 1,000, a tax of one *boliviano* ( $96\frac{1}{2}$  cents gold) for each *estrada* being the annual rental



STRAW BOATS ON LAKE TITICACA.

for fifteen years. A heavy penalty was imposed upon persons holding rubber trees not legally obtained. For the protection of laborers it was decreed that they need not accept food or clothing in lieu of wages; that there should be no corporal punishment; no deprivation of personal liberty, and, if diseased or ill, they were entitled to free medical attendance.

Under these laws some great colonization schemes were projected and hundreds of miles of good cart roads built. One very ambitious attempt to get an outlet into the Amazon was the building of a cart road

around the Falls of the Madeira, 112 miles of which was completed. The project was abandoned, however, as it was impossible to get laborers to complete it.

It is interesting to remember that the history of Bolivia contains no instance of diplomatic claim against that country for any violence, damage, or injury to foreigners. Foreign capital and particularly alert promoters were quick to appreciate not only the richness for opportunity but also the safeguards she extended to them. In July, 1900,



TAPPING PARA RUBBER TREE, BOLIVIA.

concessions were taken out to the number of 17,345 *estradas*. Numbers of the *concessionaires* were willing to pay one *boliviana* per *cstrada* for one year, and then float the concession, as the contract did not require development. The Bolivian government, beginning to appreciate that, in spite of the tremendous numbers of concessions granted, the amount of rubber was not increasing as it should, made a new law, restricting the area granted to individuals and companies, and putting a value on the land of 10 *reis* per square meter. Two years later it was found that



110,000 *estradas* had been abandoned; presumably they were taken up by promoters who had no intention of developing them.

The great *seringaes* were not established without much trouble. For example, one company floated in Europe started some 500 people for the Amazon, reaching Pará in flood time. They went on and, trying to reach their river by a short cut, had many accidents and many of the adventurers died. The remainder got there finally, but most of their



SMOKING PARA RUBBER, BOLIVIA.

troubles could have been avoided by a little knowledge of conditions in the Amazon basin.

Had it not been for the tremendous cost of transportation the *concessionaires* and trading companies would have made millions. For in 1882 they were paying gatherers \$9.65 per 100 pounds of rubber. In 1900, however, the price had been increased to five times that amount.

One of the greatest companies administered by Americans had much trouble in getting the natives to work. They, therefore, imported a few Italians and secretly paid them high wages to act as pace makers. The

result was that the natives got in a perfect frenzy of accomplishment which they have lived up to ever since.

Recurring to the transportation problem, it will be remembered that, for the cession of the Acre territory to Brazil, Bolivia received \$10,000,000, which she pledged herself to spend upon railroads. To carry this out the Bolivian Railways Co. was incorporated, to expend \$35,000,000 in railroads that should improve the outlet of Bolivia to the Pacific, and also by stretches of roads around cataracts to open up transportation through the *Montaña*.

Most of the great rubber estates both on the upper and lower Amazon



CUTTING RUBBER FROM PADDLES, BOLIVIA.

are to-day owned by wealthy individuals or companies. Their first titles came to them through discovery and occupation. Later surveys were made and legal titles were granted particularly where the first occupant got in financial difficulties and a creditor took the property over. There are still properties for which the owner has no real title and which he holds because of his expertness in handling a rifle.

These are the men who in the past were preyed upon by bands of "border ruffians" called *capangas*, who descended on them and gathered in their rubber in swift night attacks. These "border ruffians" were

said to be employed by *negociantes* or traders and the different bands were in a state of constant warfare with each other. These battles were not very sanguinary. An eye witness relates a pitched battle between two armed bands where 2,000 shots were fired, the total execution being one bullet hole through the shirt of the leader of the attacking party. Appalled by such a happening, he promptly put a white cloth on a pole, raised from behind a stump where he was crouching, while he led the charge and promptly surrendered.

The tree that produces Bolivian rubber is undoubtedly a *Hevea* and is said by some to be the *Hevea lutea*. It grows on the uplands to an



FIRE BRANDING RUBBER, BOLIVIA.

altitude of 3,000 feet, and on sloping, well drained ground, and not in swamps or where it would be subject to inundations. The trees are tapped for about three months each year, and then are allowed to rest. The rubber when carried up the rivers, by muleback over the mountains, by boat across Lake Titicaca, and by railroad to Mollendo, is said to cost, exclusive of the export duties charged in Bolivia, about 40 cents a pound.

Bolivian rubber is gathered somewhat differently from that down river. There is used a *mango*—literally a handle to which is attached a flat disk 6 to 8 inches in diameter. This is used as the ordinary paddle

is. Where much smoking is to be done a disk to which two handles are attached to opposite sides is substituted. These handles are supported by cross pieces which allow the disk to revolve rapidly over the *buyon*,



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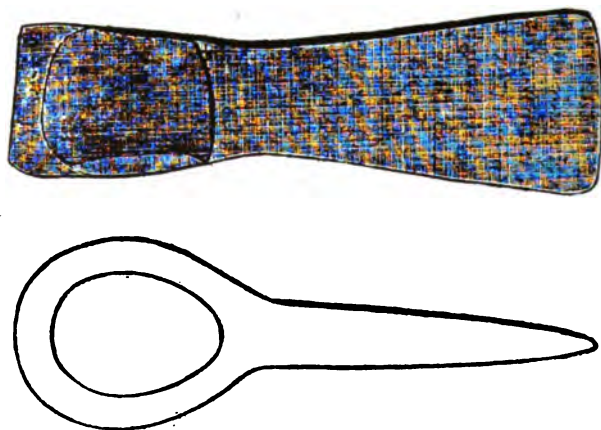
SUAREZ, BOLIVIA'S RUBBER BARON.  
(Sketched at his home in Bolivia for the Author.)

or smoking pot. Indeed, to facilitate matters there are sometimes three or four of these pots in a row.

Two methods of branding rubber are in use. One which is known as "fire" branding consists in heating a die and pressing it into the outside surface of the rubber. The other way is to have the name of the

*seringal* cut on the surface of the paddle; then when the *pelle* is cut open the rubber is found to have taken an exact replica of the brand.

In the upper rivers, where the water is very shallow, the rubber takes its first journey on *balsas*, or small rafts. If they are to pass over rough water, the logs of which they are made are hollowed out. These recesses are filled with rubber and the whole is floored over, so even if the crew is upset or lost the rubber survives. Two or more *balsas* joined together form a *callapo*, which is used when the river broadens to admit larger craft. Still further down the rivers the *batelão*—commonly pronounced “batalone”—is used as freight carrier.



BOLIVIAN TAPPING AXE.

(The first view shows the full size of the “machadine.” The second shows an outline, with the eye for a handle 2 feet long.)

The dry season in the Bolivian rubber country is from June to November and the rainy season from December to May. The climate is hot and exceedingly humid. There is a decided drop in the temperature at night, much more pronounced than in the lower Amazon, and the consequent danger from chills. The disease most prevalent is tertian fever, called *terciana*, and a large percentage of mortality is due to it. It is claimed that there is not much danger from this if one avoids freshly plucked fruit and alcoholic beverages.

One of the most romantic figures in the Amazon basin, who is established above the Falls of Madeira, is Nicolas Suarez. Of Bolivian birth and speaking only Spanish, he has for years practically controlled

the carrying trade up and down the Madeira, as well as the gathering and collecting of the rubber along many of the great waterways above the falls.

If Suarez's life history could be written it would prove a very stirring tale. He began as a trader for rubber, dealing with savages whom none other had dared to even communicate with. Soon he and his brothers began to acquire great concessions. They pushed further and further into the interior, trading with the Indians, practically ruling them, and avenging any insult or lack of faith most terribly. One of his brothers was murdered by savages, and it is said that Nicolas Suarez practically exterminated the tribe to which his murderers belonged.

He employs probably about 4,000 men, and is said to be worth from \$35,000,000 to \$40,000,000. A born organizer, he is still a simple, saving man of the people. But his nephews, liberally educated, living in Europe, are genuine men of the world.

## CHAPTER XIX.

THE RUBBER FOREST COUNTRY OF PERU—A RUBBER REVOLUTION—FOREIGN CAPITAL IN PERU—IQUITOS AND ITS GROWTH—THE "DINING HALL OF THE WORLD"—PERUVIAN INDIANS—VARIOUS PERUVIAN RUBBERS—THE COMPLETE STORY OF CAUCHO—PARA RUBBER OF PERU.

FULLY two-thirds of the territory of Peru, an immense region of 700,000 square miles, is embraced in the forest lands east of the Andes, known as the Forest Country, or *Monta a*, and is watered by a great network of rivers. These forests are not only rich in cinchona, vanilla, and cacao, but there is a great deal of india-rubber. As far back as 1853, Markham visited rubber camps there, and among other things described the singular vessels used for conveying latex. They were joints of bamboo, three feet long and four inches in diameter, and called *ypas*. These are still used.

*Pobre Peru* (poor Peru) was most expressive. Robbed of her rich nitrate beds by Chile, her rich silver mines owned by British capitalists, the cinchona industry ruined by plantations in the Far East, the railroads in the hands of a British corporation, and the customs pledged to them, with millions of acres of the best forest lands given away to the same outside interests, it surely was "poor Peru!"

The mining engineers were the first to appreciate the forest wealth, and great tracts of land were acquired not only to exploit the minerals, but rubber and other products. This practically put foreign capitalists in charge of the best of the *Montaña* regions. Then Brazilian rubber gatherers in the territory, together with native gatherers, started an insurrection, the idea being that the territory became a Brazilian dependency. The government at Lima dispatched an armed force over the three ranges of mountains and declared Iquitos a closed port. The soldiers, however, preferred rubber gathering to fighting, and were supposed to have joined the revolutionists. The result was the appointment of a commission of arbitration and the discovery that Peru did not know what her eastern boundaries were. The commission decided on the river Javary as a boundary line, incidentally cutting off from

Peru a very large and rich rubber territory, not purposely, but because of a mistaken idea as to the direction in which the Javary ran.

In the meantime the great foreign companies were opening roads and doing much to make the country accessible. One company alone in nine years opened 270 miles of fine road over the Andes to the navigable waterways of the *Montaña*, and in 1904, 1,300 miles of such roads had been constructed. The result was that many regions of the Inambari and Madre de Dios were within three days of Mollendo. In 1902, the fishing village of Iquitos had grown to a city with a population of 7,000, made up of Peruvians, half castes, and Hebrews. A fairly good road way connected it with Lima, the journey taking about twelve days.



SMOKING PARA RUBBER, PERU.

Fifty steamers plied between the city and the interior, carrying supplies to the various rubber camps and bringing down rubber.

The export of rubber by way of the Amazon at that time had been for two years a monopoly, controlled by an English steamboat company who employed five vessels for this purpose, vessels especially built so that they could navigate the river even at the time of low water. One result of this steamship monopoly was that freight rates were very high, sometimes exceeding the price of the cargo. About 1906, however, direct shipments were inaugurated from Iquitos to New York and Liverpool, and the city flourished as a result. The following year 7,000 passengers arrived at Iquitos, all of them connected in some way with rubber interests; 540 steamers weighed anchor from that port during that year and 21 local dealers (called *negociantes*), all of them foreigners, export-



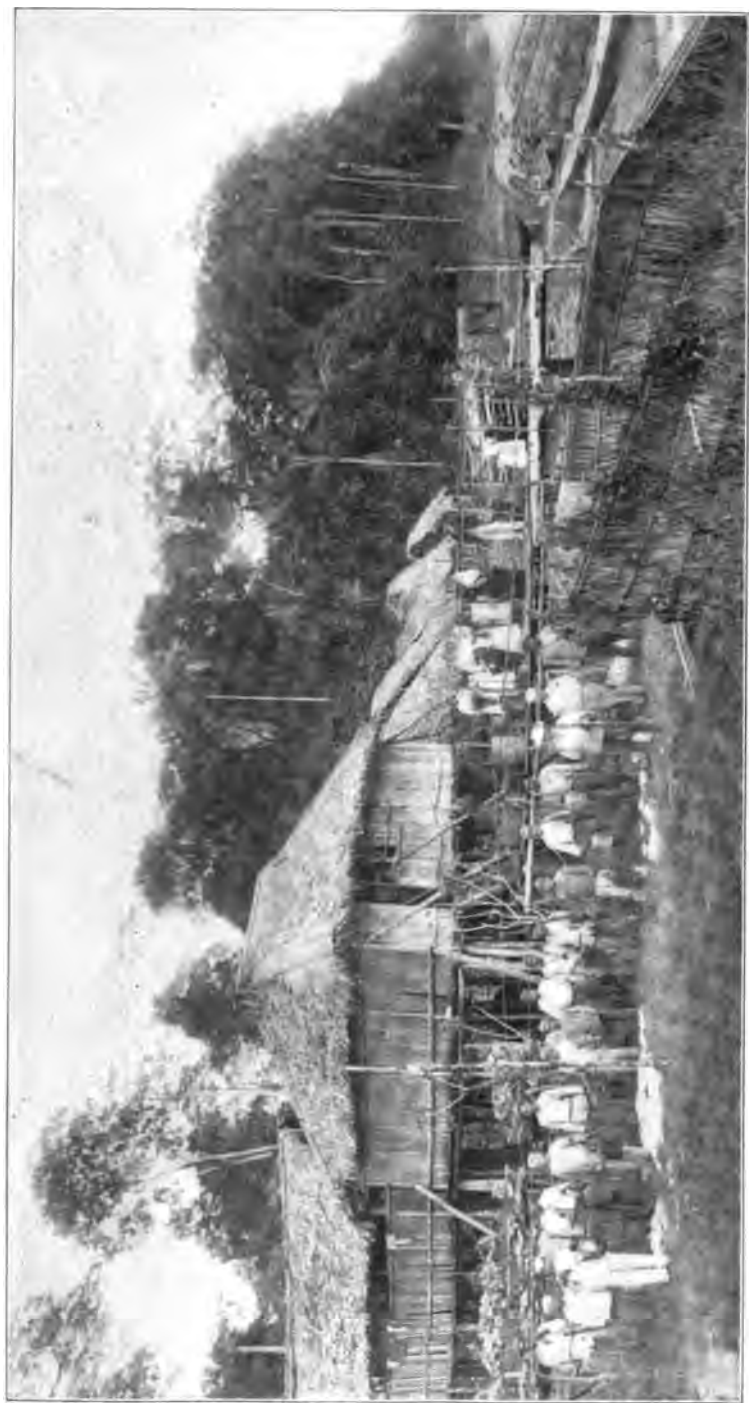
ed 7,000,000 pounds of rubber, two-thirds of which was "Para." In 1909, the exports of rubber from Iquitos had increased 33 per cent. over the last figures given.

The province of Loreto, of which Iquitos is the capital, is so rich in forest products that Humboldt spoke of it as the "dining hall of the



SHIPPING RUBBER AT MOLLEND, PERU.

world." Iquitos, a few years ago only a collection of palm thatched huts, is a rich thriving city to-day. With mean temperature of 75° to 80° F., it is comfortable, and with fourteen to twenty feet of water in the broad river upon which it is situated, it can accommodate ocean going steamers. The Amazon, called Marañon there, is navigable some 300 or 400 miles beyond the city. In other words, there is a good nav-



TYPICAL RUBBER BARRACKS NEAR IQUITOS.

igable waterway from Manáos up the Amazon for about 1,600 miles. More and more steamers go to Iquitos and, eventually, it will be a city of great commercial importance. The Peruvian *Montana* is as rich as any part of the tropical world, and when its quarter of a million Indians, many of whom are excellent workers already, awake to the dignity of labor, a greater wealth than that possessed by the Incas will be produced by them.

Speaking of Indians, one of the most important tribes, the Campas, located on the Ucayali, number some 40,000, and are said to be descended from the Aztecs. Less important are the Peros, Conibos and Shipibos. These are expert canoeists and hunters, very courageous and keep contracts most faithfully. These Indians wage relentless warfare against the wholly savage tribes, capturing them whenever they



STEAMER ON THE MARANON ABOVE IQUITOS, PERU.

can, and bringing them to the rubber camps where they insist on their being taught to gather rubber. The general Indian word for rubber throughout Eastern Peru is "sandouga."

A great many interesting stories come from the interior, as is natural. For example, it is said that the Indians of the upper Amazon had a telephone system of their own, using rubber in its construction, and there the story ends.

There are three distinct kinds of rubber gathered in the Amazon provinces of Peru: (1) *Caucho*, which is the product of the *Castilloa Ulei*; (2) *seringa*, *borracha* or *jebe fino*, which comes from a *Hevea*; and (3) the *orco-jeringa* or "weak fine" *Hevea*. There are a number of theories regarding the reason for the shortness of fiber in the weak fine. The common belief is that, as it is found on high lands far above



THE ONLY PRACTICAL METHOD FOR OBTAINING THE LATEX OF THE  
CAUCHO TREE.

the sea level, it is due to location, where the *Hevea* is not at its best. It is possible, however, that it may be caused by the admixture of another latex with that of the *Hevea*.

The tree producing cacho was for a long time unidentified, and little was known about it, except that the rubber was gathered by a system that involved the destruction of the tree. This method still obtains and is as follows:

Near the base of the tree a broad V-shaped cut is made and the latex is caught in an earthen vessel, or sometimes in a waterproof bag. After all the latex has been drained out of such incisions, the tree is cut down. Then circular incisions are made about the trunk, about two feet apart, and the latex is caught in basins or *calabashes*. The milk is



RUBBER GATHERERS' HUTS, PERU.

next passed through a sieve to remove bark and leaves, and then is ready for coagulation. Very often the rubber gatherers hew a trough in the soft wood of the fallen rubber tree in which to coagulate it, while others dig a hole in the ground and pour the milk into it. If the natives have soap or the juice of the Peruvian vine called *leche camole*, the latex coagulates very rapidly, and the result is a square block known as cacho, or Peruvian slab. This slab, cut in slices, forms what is known as cacho strip. The grade of rubber known as cacho ball is made up of the strings of rubber that coagulate in the incisions on the tree and are stripped off a couple of weeks after it has been cut down. For the sake of convenience in handling they are made into balls.

For a long time cacho came only from Peru, but it is now found

to be distributed widely throughout the Amazon valley. The caucho gatherers in large parties disappear into the trackless forests and travel sometimes for hundreds of miles over territory never before explored, destroying trees wherever they find them. It is claimed that the gatherers get from 15 to 25 pounds of dry caucho from one tree. It has often been suggested that the latex could be taken out much as the *Hevea* latex is. Native gatherers, however, claim that such cutting of the bark results in destruction of the tree by either disease or insects. It is also claimed that, when the tree is cut down, shoots spring up from the



TAPPING PARA RUBBER TREE, PERU.

stump that in a short time become thrifty trees. It is said that every eight years a *cauchal*, which is where the caucho trees flourish, can be harvested.

When one considers the slow growth of trees in the dense forest, however, the Bolivian contention that it takes twenty years to renew a *cauchal* seem more reasonable than the Peruvian.

The word *caucho*, really the Spanish for *caoutchouc*, has been the cause of a great deal of misunderstanding. Many writers speak of "caoutchouc" and of its destruction in Peru. Readers suppose they

mean that *Hevea* trees are cut down as well as the *Castilloa*, which is not the fact. Nearly all writers on Peru and Bolivia make this mistake, and even the official publications are not always clear. The word caoutchouc means rubber of any and every kind. Indeed it is a synonym for india rubber. Caucho, on the other hand, is a specific trade name of worldwide acceptance for the product of the *Castilloa Ulei*.

The gathering of caucho is done by bands of 80 to 100 Indians, organized and led by two or three white men. While the band are able to shoot some game and thus live on the country, they also carry supplies as they are liable to be lost in the forests for months. Their food supplies consist of dried *iguana*, monkey and parrot flesh, fried fish, *farinha*, *cachaca*, tobacco, and so on.

In searching for caucho trees, they look on the ground and locate



SETTLEMENT SHOWING EDGE OF THE GREAT MONTANA, PERU.

the great laterals that extend many feet from the tree trunk. They speak of two kinds of caucho, the white and the black. The difference, however, is only in the color of the bark. The latex of the caucho coagulates by itself if left in the clay lined holes into which it is poured. The invariable custom, however, is to mix soap with it and leave it over night. The coagulated mass in the morning is said to throw off the most disgusting odor which kills even the hardy mosquito of the *Montaña*. Caucho gatherers suffer from rheumatism, enemia and dysentery, but the death rate among them is small. The Indians like the work and it is very easy to secure laborers. The gatherers carry very few tools. An American axe does most of the cutting. Instead of tin cups they take certain leaves, fold them ingeniously and sew them, replenishing them at each fresh *cauchal*.

The gathering of *Hevea* or Pará rubber, which is also a large factor in Peruvian exports, is guarded by laws that are quite similar



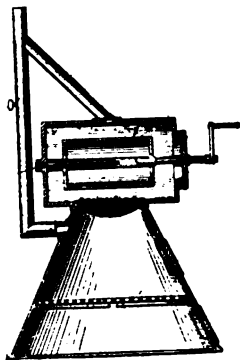
VEGETATION ON THE RIO UCAYALI, PERU.

to those in force in Bolivia. These laws are of two sorts. One form of contract is for the leasing of the lands containing rubber trees; the



other for the renting of *astradas* of 150 trees each. For the first the *concessionaire* pays a royalty of a trifle less than a cent a pound for the rubber extracted (2 *soles* per *quintal*) which is collected with the export duty. Under the second form, the government charges about 10 cents a year for each *hectare* (about 2½ acres) of land upon which the estate is situated.

The Peruvian government allows these contracts to become effective only when the land is viewed by an expert surveyor and approved. It also demands a guarantee from the *concessionaire* in the way of the purchase of interest bearing bonds, which are held for the purchaser's account, the interest being paid to him. The government has been



PERUVIAN MACHINE FOR SMOKING "HEVEA" LATEX.

exceedingly generous with those taking up lands and has voted many valuable concessions to the companies that have constructed roads.

Americans, that is North Americans, believe firmly that they are the only real inventors on their own particular hemisphere. To them is submitted a picture of Morinha's rubber smoking apparatus\* invented by a native Peruvian. It is very simple and "fool proof" enough to be used by the most stupid Indian gatherer. The ordinary smoking cone is employed, above which in a rectangular closed chamber is a revolving drum turned by hand so that the latex may be evenly treated by the hot smoke.

The government export tax on rubber is 14 per cent.

\* See Appendix.

## CHAPTER XX.

"O ACRE"—THE RICHEST RUBBER TERRITORY IN THE WORLD—ROMANTIC HISTORY OF A TROPICAL "NO-MAN'S-LAND"—THE ACRE WAR—IT BECOMES BRAZILIAN FEDERAL TERRITORY—OWNERSHIP OF UPRIVER ESTATES—ADMINISTRATION OF LAWS IN THE ACRE—MORTALITY IN RUBBER DISTRICTS—THE SEASONS.

PERHAPS the most interesting of all rubber producing territories in South America is *O Acre*, or The Acre—not a state but a Brazilian Federal territory. It lies in the upper Amazon valley, close to Peru and Bolivia, and is watered by a labyrinth of rivers great and small. Of these rivers the Amazon, the Javary, the Ucayali and the Madre de Dios, with others, either form boundaries for the territory or make the forests of easy access. It is probable that no other part of the world is richer in rubber than is the Acre. Most of the rivers are navigable, some of them for hundreds of miles, and the territory is easier to reach from Pará and Manáos than any other large Brazilian rubber producing territory. The country is healthful and the flood seasons brief. The climate is not as humid as in the lower Amazon valley, and the heat is not so unbearable as in the latter regions.

Prior to 1899 the Acre was practically unknown, was called "No-Man's-Land," and actually belonged to neither Bolivia or Brazil. This triangular block of heavily forested territory, more than 66,000 square miles in area, was not coveted by any one until rubber began to come out of it in ever increasing quantities. This rubber exploitation was accomplished almost wholly by Brazilians with *Cearenses* for laborers.

The territory had two natural outlets—one through Bolivian territory over the Falls of the Madeira and into the Amazon, the other, down the Purús through Brazilian territory and into the Amazon. The last named was the best of the two because of the open waterway to Manáos.

Although there were only two *seringaes* belonging to Bolivia in the Acre, a Bolivian custom house was established in 1899 on the Acre river and duty collected on most of the rubber that came out of that territory. Four months in that year Bolivia collected duty on 2,605,992

pounds fine and 370,636 pounds coarse. Then the Brazilians in the Acre rebelled, started a revolution under Galvez, and formed what was known as the Independent Acre Republic. The leaders offered citizenship to all residents in the district, Bolivians and Brazilians, with the exception of Nicolas Suarez, who was declared "dangerous." The population of the territory was then about 18,000, and as rubber collectors were able to get all the way from 13 to 55 pounds of rubber a day, they fully appreciated the value of the territory. For some little time it



INUNDATED FOREST IN THE PURUS RIVER VALLEY.

was practically a free state, although the leaning at Rio Janerio was for Bolivian supremacy.

In 1902 Brazil formally granted the territory to Bolivia and helped that country to recover the Acre from the hands of the revolutionists. Shortly after this Bolivia granted the whole territory to an American syndicate. This caused a great deal of feeling in Brazil, and the treaty ceding the territory to Bolivia was withdrawn. Brazilians seemed to feel that in the granting of such a concession the United States would

gain control of the upper Amazon, and their daily papers were filled with articles predicting calamities of various sorts.

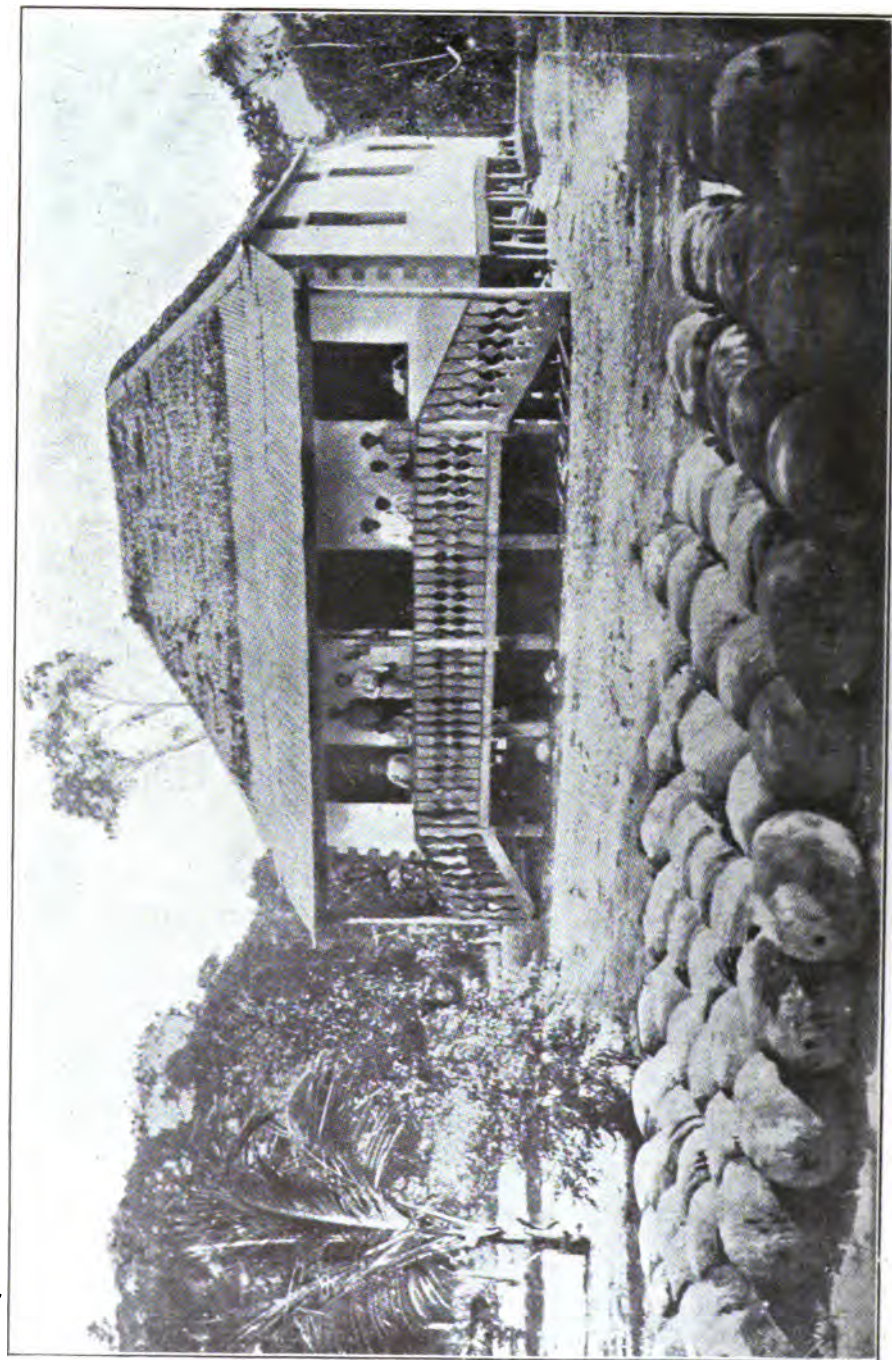
The inhabitants of the Acre, backed by the state of Amazonas, were particularly bitter in their denunciation of Bolivia's act. They considered it a great wrong for a private corporation organized under foreign laws to receive any such grant. They claimed that the Acre belonged to Brazil; because of its configuration; since all of its rivers flow into the Amazon, being the only practical outlet from the country; because there was no Bolivian population there; and finally that the Bolivians had shown utter inability to develop the territory and leased it to foreigners.

This inaugurated the "Acre war." Bolivia raised money and sent 1,000 men over the mountains. It took this expedition four months to reach the seat of trouble. The warfare was of the guerilla type. For example, the revolutionists attacked Nicolas Suarez and sacked and destroyed two of his rubber warehouses on the Acre river. The old man himself escaped to the Orton river, raised a force of rubber gatherers, came back and thoroughly trounced the revolutionists. A few days later, however, the colonel in charge of the Bolivian forces surrendered unconditionally to the revolutionists.

In the meantime Brazil was in a position to put on the screws, and she did it. She refused to allow supplies for the syndicate to go up her rivers and not only that but no member of the syndicate, employee, or laborer was allowed to use her waterways. A commission from the American syndicate had in the meantime made application to England, Germany, and Belgium and proceeded up the Amazon as far as Manáos. There is no record of their getting any nearer to their lands than that point.

About this time, however, the dispute was settled, Brazil paying a cash indemnity to Bolivia, granting her perpetual free transit through her territory, and outlet through the Amazon. Brazil also agreed to build a harbor on the Madeira river, a railroad around the Madeira Falls, and purchased the concession owned by the American syndicate. In return the territory became wholly Brazilian and is administered as a federal possession.

As always happens during family quarrels, business suffered during the Acre war. The shipments of rubber in 1898, 2,000 tons, dropped in 1900 to 800 tons. Shortly after this the Brazilian Federal government, with an idea of stimulating production, reduced the export tax on Acre rubber from 23 per cent. to 15 per cent., allowing it to be shipped from



A SERINGAL ON THE RIVER ACRE.  
(In the foreground are *pellets* of rubber awaiting shipment.)

either Manáos or Pará. Manáos promptly protested, claiming that rubber gatherers in Amazonas near the Acre district would smuggle their rubber over the border and ship it in as an Acre product. The figures were therefore changed back to 23 per cent., of which 8 per cent. was to be refunded when it was positively proved that the rubber came from the Acre.

One of the first things the Federal government did was to issue a proclamation forbidding laborers to leave the employ of their masters



"SERINGAL" SEBASTOPOL, ON THE PURUS.

if they were in debt to them. They were heavily fined for so doing as were also the owners of *seringaes* who hired them.

Laws were also issued by the Prefect, requiring owners of *seringaes* for two years or more to stake their boundaries so as to obtain titles. They were required to pay to the Federal government 5/100 of a *real* per square meter for the land. Provisional titles were also issued to those who explored and took possession of land for six months. Both territorial and Federal government shared in this fee, making ownership doubly secure. After 30 provisional and 10 or 12 final titles had

been granted it was discovered that the Prefect had no authority. This was the cause of much confusion as some who had lived there for years and made great sacrifices that the country should be Brazilian were placed in a position where they practically had no titles for their properties.

The ownership of rubber estates in the Amazon country is very interesting. Of course where large *seringaes* are established and fine buildings put up, good titles are forthcoming. A great many claims, however, belong to business houses in Manáos and Pará. These they



TOWN OF CANUTAMA, ON THE PURUS.

sell or rent, and get them back again in either case very often. Along the more accessible waterways the country has been thoroughly prospected for rubber and it is all owned. But there are scores of small tributaries, accessible to steam launches, awaiting discovery and occupation. Taking possession of a tract is often the only title for years, then perhaps the nominal owner dies and his chief creditor pays for a survey and purchases the land from the government. The smaller owners of such estates are often obliged to defend themselves from rubber thieves and even the larger estate owners have men with rifles to protect their

property. Years ago the same state of affairs existed on the lower Amazon, but disorders of that sort have ceased and it is only far in the interior that the individual makes and executes his own laws.

Brazil divided the Acre territory into three districts. In each the Federal law is administered by Prefects and they in turn are responsible to a Governor. It is a curious fact that Bolivian money is very largely used for the Acre district, and is the basis of all exchange.

Although the laborers are illiterate, the owners of the *seringaes* are among the most alert and progressive business men in the Amazonian basin. Some of them control immense properties, own their own steamers, and are experimenting with new methods of collecting and coagulating



CONFLUENCE OF THE ACRE AND PURUS RIVERS.

rubber constantly. For example, some of them have looked into the coagulation of latex as it is done in the Far East. If some such method were adopted it would be a great boon to the laborers. To-day, the man who smokes latex over the palm nut fire gets overheated, and then plunges into a nearby stream to cool off. The result is fever and often-times death.

The Acre district has a number of towns that are rapidly becoming important; it also has newspapers and in 1909 held a rubber congress. Among other questions considered at that convention were the protection of Brazilian supremacy in crude rubber, the systematizing of the business



of collection and shipment, and the securing of greater profits. The spirit of modernism also is growing very rapidly. In 1909, when crude rubber went to \$1.56 a pound, one of the "cities" proclaimed a holiday. A parade was formed, speeches were made to and by the government delegate, and the whole population was treated to champagne.

Much of the upper part of the Acre is still practically unexplored. The isolated rubber gatherers there are visited by peddlers in canoes who smuggle to them provisions and liquor and get rubber in return. It is said that individuals on river steamers lower down are not averse to doing the same thing. Of late years not only have *Cearnses* gone up



OUTFITTING RUBBER GATHERERS AT A "SERINGAL" ON THE ACRE RIVER.

the river but many Barbadian negroes have become rubber gatherers.

The mortality of the rubber districts of Brazil has always been large. It was reported for example, when the census of the Purús river district was taken, that enough immigrants had gone there to make a population of 40,000 yet the figures showed 16,000 remaining. It is not probable that all or one-half of the 24,000 missing perished. Still a great many were victims to disease, as a rule brought on by their own lack of care. The traveler's tales that each ton of rubber costs a

human life cannot be substantiated. Natives die off from *cachaca*, from fevers brought on by drinking unboiled water, and because they will not protect themselves from mosquitos at night. At present there is no way to make them take better care of themselves.

In the upper valleys the rainy season begins in September and ends in December, while in the middle and lower valleys it is months longer, beginning in November and terminating in March. In the southern regions the rains begin in June and end in October. It will thus be seen that the Acre territory offers a much longer working season than the others. The fine grade of rubber known as "Purús" comes from the Acre. In the dry season, which is when most of the tapping is done, the *seringueiros* live very well indeed. In addition to their regular supplies, there is a great variety of game—wild pigs, tapir, deer, black monkeys, and turtle. There are also fish, great and small, wild turkeys, geese and ducks, and turtle eggs by the canoe load. Although fresh vegetables are not obtainable, there are many forest fruits that take their place and prevent illness. The fresh meat must of course be used at once as it will not keep. Turtles, however, are kept in stock by penning them in a pit until ready for cooking.

The wet season, however, is a time of trial. Rain descends in sheets and appalling thunder showers are almost of daily occurrence. It is apparently hotter than ever, a steamy hotness that is very trying. The river rises so that rubber gathering is impossible. The fish disappear in the flooded lands and are almost impossible to catch. Tapir, deer, wild pigs and even the game birds seek the higher lands far away from the river. Insect pests multiply and, between threatened starvation or annihilation by mosquitos or hungry alligators, the *seringueiro* is at his wits end. Of course he could provide against this very easily but he never does.

## CHAPTER XXI.

MATTO GROSSO, A GREAT UNEXPLORED COUNTRY—GATHERING OF MATTO GROSSO RUBBER—COLOMBIA ON THE AMAZON—"HEVEA," CAUCHO, AND BALATA—VENEZUELA AND THE RIO NEGRO—"ANGOSTURA" RUBBER—THE CASIQUIARE AND THE FORESTAL DISTRICT—CARELESS RUBBER GATHERING.

**T**HE great Brazilian state of Matto Grosso, in the southern part of which were at one time productive diamond fields, will doubtless be the next great producer of rubber. It produces considerable now, but has possibilities in the way of infinitely greater production, once its territory is explored. It is over 500,000 square miles in area, reaching from Amazonas on the north to Paraguay on the south. The Guaporé river, which flows into the Amazon through the Madeira, is part of the boundary line between this state and Bolivia. The river just named is but one of a number of important streams, coming from the great forest reaches in which is much rubber. Of the others, perhaps the Tapajós is the most important.

The state of Matto Grosso is very sparsely populated, 150,000 souls being a liberal estimate. No portion of the Brazils is perhaps better named than this, the words meaning "Dense Forests"—practically as dense, indeed, as at the time of its discovery 400 years ago. The forest lands are wonderfully rich in valuable woods, medicinal plants and barks, and all the sturdy pioneer needs to do is to go in and help himself.

It was as late as 1893 that rubber trees were discovered in Matto Grosso and the official report declared that there were "thousands of millions" of them. In 1900 a party of young Americans went to Matto Grosso to hunt for rubber. They disappeared into the trackless forests and were never heard of again. A relief expedition sent in months later could find no trace of them, and indeed came near suffering the fate of those whom they were trying to relieve.

With the extension of railways from southern Brazil, the opening up of such great concessions as that granted to the Madeira-Mamoré Railway Co., on the Guaporé river, and the constant pushing up such rivers as the Xingu by rubber hunters, the forest interior must soon be known and exploited.

Undoubtedly Matto Grosso rubber came out through the Xingu, the Tapajós, and the Guaporé long ago, but with no record of just where it came from. No such system for rubber collection, as yet, obtains in this little known territory, as is in vogue in the rest of the Amazon valley. Where there is regular rubber gathering, *estradas* are laid out,



MAP OF THE VENEZUELAN FORESTAL.

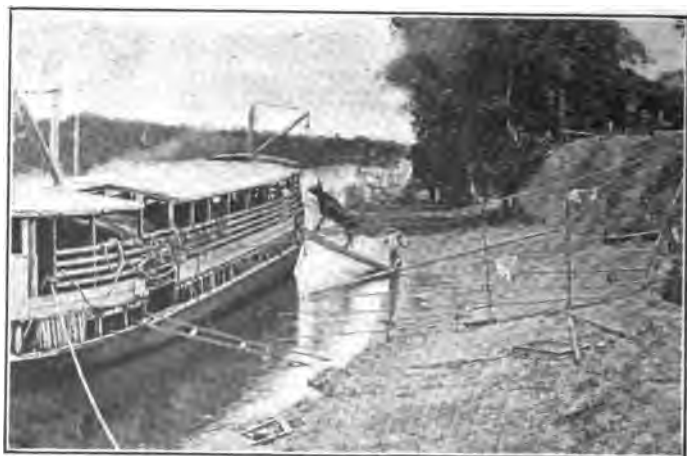
each gatherer attending to something like 100 trees. According to de Mello, latex cups are not attached to the tree itself, but little troughs made from the wood of the "bority" palm are fastened to the tree with pegs, the joint between tree and trough being filled with clay. He claims that the milk is coagulated by the addition of alum dissolved in hot



"BATELAO" IN THE RAPIDS, UPPER RIO NEGRO.

water. The freshly coagulated latex is then pressed between boards to expel as much water as possible.

His description is not altogether clear in many respects, and it may be that he has confused the coagulation of the *Hevea* latex with the boiling of the "mangabeira" milk. It is, however, true that much of the



EMBARKING CATTLE ON THE UPPER RIO NEGRO.

Matto Grosso rubber is poorly handled, and is usually air cured instead of being smoked. That, however, will rectify itself when the territory is opened, as the smoked product brings a much better price. Matto Grosso "coarse" is to-day quite common; "fine" and "medium" are also on the market. The state export tax on rubber is 20 per cent.

Most of the rubber exploitation in the Brazils has been south of the Amazon. That there are a great variety of rubber producing trees north of the Amazon is undoubted. There are many sections where the *Hevea*



RIVER SCENE ON THE UPPER RIO NEGRO.

*Brasiliensis* does not seem to be present. The *Guyanensis*, however, is very widely distributed, and produces a rubber that is well worth gathering, although it is probable that it needs different treatment in coagulation from *Brasiliensis*.

The Amazon for more than 600 miles forms a boundary between Brazil and Colombia. There is a vast territory north of the river that is watered by the Putumayo, the Napo, the Caqueta, and their tributaries, forming a wonderful system of waterways into a country rich in *Hevea*



TOWN ON THE RIO BRANCO.



"FAZENDA CAPELLO" ON THE RIO BRANCO.

rubber, in caucho and balata. Very considerable quantities of rubber come to Manáos from this section. This territory has been more or less worked for many years, although the rubber has not been very extensively gathered, the early exploration having been for quinine. It appears on the map as being Colombian property, but it is well to add that it is claimed by Peru. Indeed, Peruvian custom houses were established and taxes collected on all exports. The governments of Colombia and Peru, how-



"SERINGAL" ON THE RIO BRANCO.

ever, put in force a *modus vivendi*, giving both countries equal rights on the Putumayo until the boundaries are settled by arbitration.

The southeastern federal territories of Venezuela, notably Amazonas, drained by the Rio Negro, are rich in rubber trees. A certain amount of rubber known as "Angostura," fine and coarse, comes down to Manáos and once the territory, particularly to the east of Bolivar, is explored, both rubber and balata undoubtedly will be found in abundance. There are scanty records of the rubber that comes from Venezuela by way of



the Rio Negro. Sometimes it is noted and oftentimes it is claimed as a Brazilian product. In 1902, for example, 48,000 kilograms of fine Pará and 20,000 of coarse were credited to Venezuela, but other years, when just as much came in, there are no official figures to show for it.



FOREST SCENE IN COLOMBIA.

The upper Rio Negro, it will be remembered, is joined to the upper Orinoco by a river known as the Casiquiare, so that there is a waterway from Manáos to the upper Orinoco. It is a narrow, turbulent, canal

river with one small cataract and several rapids, and is really navigable only to expert canoeists.

The Venezuela territory, that has its outlet through the Rio Negro and depends on the city of Manáos for its market is called the Forestal District, and is some 300,000 square miles in area. Nearly the whole of this is at present government land. Some 38,000 square miles of this rich land is drained by the Rio Negro. Parts of the country are hot and unhealthy. The inhabitants of this part of Venezuela are chiefly Indians. For example, in the territory of Amazonas the population is 46,000, of which more than 45,000 are Indians. They are a docile, unambitious type of humanity, willing to work under proper direction.

The Venezuela government is more than willing to have this territory developed and *concessionaires* who take up development problems honestly and energetically get excellent treatment. Promoters of fraudulent schemes, however, once they are recognized, can get into more trouble than anywhere else in the world.

Rubber gatherers up the Rio Negro are more careless than they are south of the Amazon. They make a trough around the body of the tree, using the pith of the "miriti" palm. Above this are made incisions, and as the latex runs down into the trough, it drains off into a little earthen pot set on the ground. Hardwood smoke is used in curing instead of palm nuts.

Just as a bit of rubber history: An alert promoter once interested American capitalists to the extent of backing a great rubber gathering company on the banks of the Casiquiare. As far as could be learned the nearest he got to his rubber fields was the city of Manáos, 800 miles away. That, however, did not prevent him sending out exhaustive reports of the number of trees that he saw, tapping that he did himself and adventures that came his way. His descriptions of the flora, of bird, beast and insect were marvelous, and were innocently published in the company's advertisements. He was the only man in the world who ever saw birds of Paradise in South America, and his company the only one that ever published the fact of their presence among *Hevea* trees to allure investors

## CHAPTER XXII.

DOWN THE AMAZON IN A FREIGHTER—SANTAREM AND WICKHAM—THE NARROWS AGAIN—ARRIVAL AT PARÁ—RUBBER PLANTING LANDS—EXAMINATIONS OF THE "RAIN FOREST"—"CAPOEIRA" LAND.

THE journey down the Amazon was fully as interesting but briefer than the upstream voyage. The captain was a veteran in the Amazon trade, and knew Manáos thirty years before, when it was only a farmyard, and Iquitos when it was an Indian village. He gave me his cabin and laid himself out to make me comfortable. The boat was a slow one, but *with* the current we had no trouble in doing 13 knots, and passed Itacoatiara early in the evening. The river had risen 10 feet since we came up, and by the water marks on the trees had still another 10 to go. The floating logs, trees, and grass patches had multiplied greatly.

The food was excellent, the drinking water good, and, swinging our hammocks high up on the rear deck, we were very comfortable. The big, flatbottomed freighter was as steady as a rock, and slid through the water as if she was greased.

I was up at six the next morning and found it raining heavily. All the forenoon we passed through exceedingly heavy showers. The rain drove under the awning more or less, so I put on a rubber coat and wondered if friends at home would believe how cool it was at midday directly on the equator. We passed Santarem that afternoon, and got a good view of the sandy beach in front of the town, its big white church, and its little one story houses with the blue fronts and red roofs. We also saw the wireless station—the "deaf and dumb wireless" as the captain graphically described it.

The Tapajós river enters the Amazon opposite Santarem, and as it is not as muddy as the latter, it shows the same line of black water as does the Rio Negro, although in lesser degree. It is a good thing to remember that Santarem is the place where Wickham back in the '70's was installing a small rubber plantation and watching for Opportunity. Luckily for the planters in the Far East it came, when the big

British steamer *Amazonas*, without cargo and without cash to buy one, hove in sight. Wickham, practically penniless, chartered it for the Indian government, stored baskets of *Hevea* seeds in its huge hold, won hasty clearance from Pará for "rare botanic specimens," and got the seeds to the Kew gardens alive and vital. Every *Hevea* tree in the Far East and thousands in other parts of the world are a direct result of that act. The British planters should erect a splendid monument at Santarem in honor of Wickham, but they will never do it—with the consent of the Brazilians.

It is interesting to note that Cross secured a thousand *Hevea Bra-*



AMERICAN HOME IN SANTAREM.

*siliensis* plants which he shipped to Liverpool in October, 1876. Wickham's seeds reached Kew gardens, June, 1876. Both the seedlings from Kew and the plants sent by Cross to Peradeniya and Heneratgoda gardens, Ceylon. Wickham's undoubtedly got there first and made up the government grove that afterward supplied rubber seed to every part of the tropical world.

One night a boat of our own line saluted us in passing, showing a flare which burned green for three minutes, then shot up three white balls, lighting up the yellow waters and the black jungle most weirdly. When we reached the place where the German boat had grounded, although it was broad daylight, it rained so heavily that one could not see

a boat's length ahead. The pilot knew where we were, but he also knew what the river could do in the way of making new channels and obliterating old ones, so we anchored until it cleared.

The next morning at 6 o'clock we were about twenty miles from the beginning of the "Narrows." About 8 o'clock we were off Garupá, where there is quite a settlement. Here the current was not as strong, the shore began to be fringed with palms, and it grew much warmer. We began to see rubber trees, huts on stilts, and banks awash at the river's edge. We thought we had been through heavy rains. But the shower that came driving up through the narrows so far outclassed any



PLANTED "HEVEA" (32 MONTHS OLD) AT SANTAREM.

former experience that we decided we hadn't really known what rain was. It passed after time, however, and we went on. The Captain and I had tea and toast, standing up to take it, for there was no dry place to sit, even on that awning shaded deck. At 4.30 we passed through *Furo Grande*, casting the lead every few feet, as many boats go aground here. We got through without mishap, however, and turned in at 8.30 that night, with the assurance that we could be in Pará at dawn.

The morning of our arrival at Pará we were up at 5.30, sighting the islands of the city an hour later. By 9 o'clock we had breakfast, successfully passed the doctor and the customs, and, entering the launch

which friends had sent out, went ashore. To my surprise and pleasure I found that the rubber exporters and merchants had arranged that I should be their guest while I stayed in the city, as well as at a banquet to be given that night at the *Café da Paz*.



YOUNG PLANTED "HEVEA" ON TAPAJÓS PLATEAU.

I was fortunate enough to know the acting director of the Pará Agricultural Experiment Station and get his ideas on local planting. He was a young American, was an instructor in botany in an American

university, and later at the head of an important section in the United States Department of Agriculture. More than any other he has studied the problems of rubber planting in the state of Pará. I quizzed him very searchingly, and the following is his statement, almost *verbatim*, and it is worth serious consideration:

Although in itself the greatest rubber shipping port in the world, the immediate vicinity of the city of Pará seems never, except by a



OLD "HEVEA" TREES IN THE FOREST NEAR SANTAREM.

few better informed and more far sighted than others, to have been considered seriously as a factor in the production of plantation rubber. Nevertheless, this district possesses advantages and opportunities afforded by none other.

The city's proximity to the sea and its natural advantages as a port are so well known and its advantage in this respect over upriver points, where higher freights would be unavoidable, are so apparent that they

may be passed over. Then Pará possesses a railroad of 250 kilometers (155 miles) in length, which affords access, ignoring the still much too prevalent belief that *Hevea* delights in wet and swampy locations, to a tract of well drained and healthful territory, immune to the caprices of annual floods, which is capable of producing a grade of rubber comparable to any now coming from the Amazon valley. This territory was

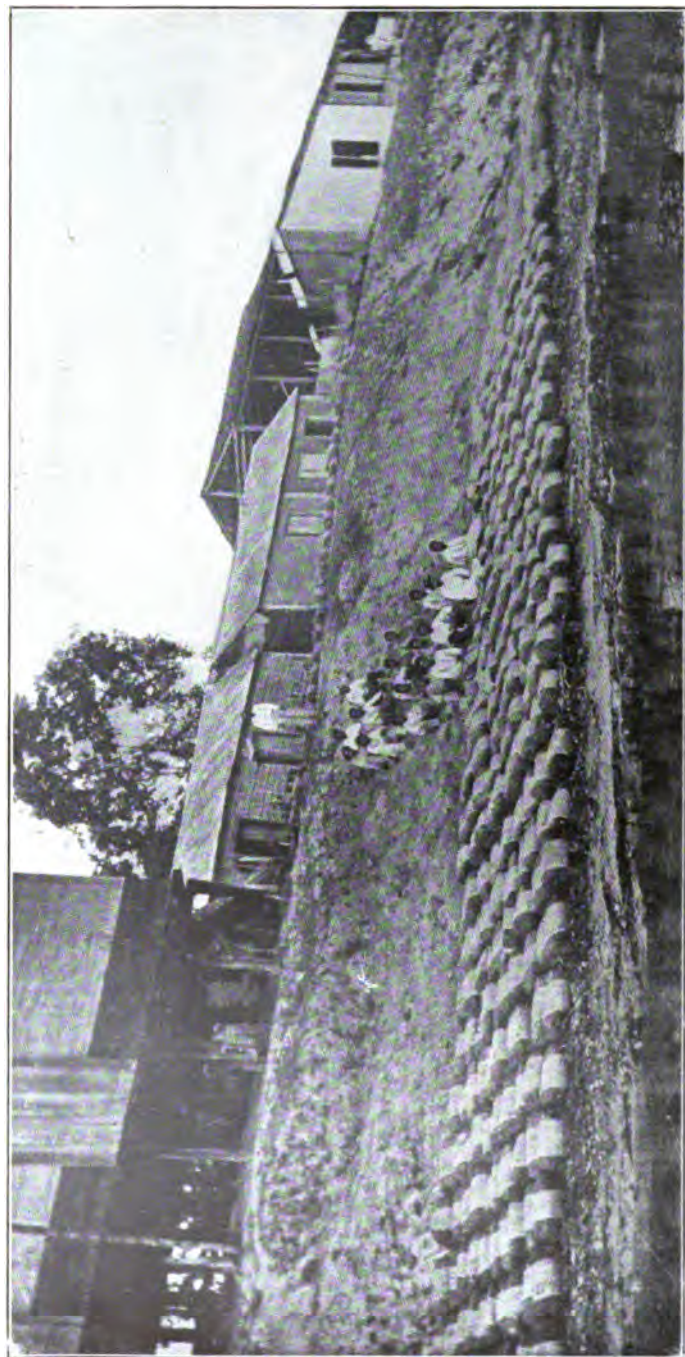


OLD "HEVEAS" ON BORDER OF STREAM NEAR SANTAREM.

personally inspected by the writer with the express purpose of investigating its suitability for rubber culture.

This section, speaking of the more accessible portion south of the river, forms part of the great forest system of the lower Amazon and extends in an unbroken stretch, practically without variation, eastward to the sea and southward to the mountains. The formation is a typical tropical rain forest; the large trees, among which are some veritable





A SHIPMENT OF CAUCHO AT ITAITUBA, ON THE TAPAJOS.

giants, stand comparatively far apart and represent almost innumerable species; the undergrowth is somewhat more compact, the small trees are straight and slender while the whole is intertwined with *llanos* and made practically impenetrable. Extremely hard and durable woods are plenti-



THE STREET OF CEARENSES, PARA.

ful, some defying both the axe and the agencies of decay, but the trees of any one given species are so isolated and difficult to find and reach that remunerative lumbering is out of the question. The small trees and *llanos*, or *cipos*, serve many useful purposes in the construction of houses, fences, and tools.



THE RAILROAD TO BRAGANCA, PARA.

In this forest the rubber tree is no exception to the general rule, as it is scattered and found in isolated locations like the other native species. The large size of the specimens found, however, even when in

competition with other and oftentimes more vigorous denizens of the forest, testifies to its adaptability to its surroundings. In some localities, it is, of course, more plentiful than in others, as those who remember recent newspaper accounts of discoveries made near the borders of Maranhão will know. There are also in the city and along the Bragança railroad, Pará rubber trees of a foot or more in diameter, which were planted and are now producing rubber of the finest grade. These are large, strong and productive, even when much crowded and neglected.

Labor does not present any unusual difficulties near Pará, nor are the forests difficult to remove. Raw labor is available in almost unlimited quantities near the city. It is easy also to import men from southern Europe and the Madeiras, a class which rapidly accustoms itself to the climate, which is not at all unhealthful, especially in the higher districts away from the vicinity of the rivers.

The native custom of clearing the land of forests is to fell the small trees and ring, or kill by fire, such of the large trees as have not yet been removed for their valuable timber, and then to set fire to the whole when somewhat dry. This practice destroys the most valuable elements of the soil for the time being, making it useless for more than one or possibly two crops of corn or *cassava*, but the supply of potash made available by the combustion of the timber serves as a stimulant for plant growth, which can be improved upon later by mulching or by a system of green manuring.

In what is known as *capoeira* land—i. e., abandoned clearings, which have been covered by second growth—the cost of clearing is, of course, much less; the humus has been restored to the soil, oftentimes in greater quantities than ever before, and a clearing can be made simply by felling the young growth of trees, which can be left to decay. This does away almost entirely with the extra expense of burning and cleaning up after felling; besides it preserves the humus in the soil and adds an additional amount with a mulch by its own decay.

## CHAPTER XXIII.

PLANTING INTEREST IN PARÁ—NEW PLANTING LAWS—A WORD ABOUT THE TAPPING SEASON—WHAT PARA RUBBER TREES YIELD—THE "RECEBEDORIA."

THE planting idea seemed to have taken a strong hold upon the residents of both Pará and Manáos. I talked long with one large operator in the Acre who assured me that his house had already planted more than 100,000 trees. There were those who were urging the governor of Amazonas to grant subsidies and concessions of all sorts, but while he was most favorable to the planting idea, he did not see his way clear to favor exactly the plans put before him.

Pará had just passed laws designed to encourage rubber planting. These covered a premium for trees actually planted; the gratuitous distribution of seeds; and a reduction of 50 per cent. on the export duty on rubber for ten years, and 30 per cent. for the next ten years. There was also an opportunity for the company to borrow money from the government at a fair rate of interest, and a proviso that the planting company must maintain a school for twenty orphans who must be taught the elements of tropical husbandry.

From a practical standpoint the trouble about any rubber planting proposition in Brazil is that governors, like our own presidents, normally last only four years. An unfriendly governor may not be able to cancel a contract, but he can easily interpret the various articles so that it would be valueless. Not that there is any present indication of such change or such attitude, but the time might come when such action would be thought advisable.

My own hope was that the governments of both Pará and Amazonas would remove the tax on plantation grown rubber entirely for a series of years. That they refused to do, as there were decided difficulties in the way. For example, wild rubber prepared as is plantation rubber would be sure to appear, and if a company owned both wild and planted rubber the temptation would be to get most of both kinds upon the market without an export duty.

Nor is the clause placing export duty of planted rubber at one-half

that of wild rubber an attractive proposition. It should have been a definite sum like 5 or 10 cents a pound; or a definite percentage on the sales value of the rubber, say 5 or 10 per cent. Another thing, the idea of the planter running an industrial school or orphan asylum in connection with a business venture will not appeal to many. It is more than likely that these laws will be amended and simplified. Indeed, their very presence is a decided advance, and a strong symptom of the desire of the government to encourage planting on a large scale.

It may be that I have not made it plain just when rubber is tapped. Speaking broadly the tapping season is from August to January, about six months. Actually there is tapping on all of the time, for in some



THREE YEAR OLD RUBBER AT DIAMANTINO.

places the inundation is not enough of a factor to stop it. It must be remembered also that during the rainy season it doesn't necessarily rain every minute and there are mornings when the *seringueiros* are able to secure a certain amount of latex with no admixture of rain water.

A great many different figures are given regarding the yields of Pará rubber trees for the season. In the lower Amazon some estates are said to go as low as a pound a tree, others yielding 2 and 3 pounds. When certain estates on the island of Marajó were sold a yield of nearly 9 pounds a tree was claimed. An analysis of their annual production however brought the figures down to about 7 pounds a tree.

A prospectus of an Amazonas estate near Manáos claimed 17 pounds per tree, while an expert estimating on the same property put the yield at 10 pounds per tree. Collins, in his report on the lower



AN INDIAN TAPPER WITH MODERN METHODS.

Amazon, spoke of a daily yield of 2 ounces per tree, which would equal  $22\frac{1}{2}$  pounds per season. Conway, speaking of yields in Bolivia, estimated that they were never less than 3 pounds per tree, and never

more than 7. A French Bolivian syndicate however figured on 13 pounds a tree. Figures on the Purús give 11 pounds per tree, on the Juruá 15 pounds, and the Acre 9 pounds per tree. For an average Sir Martin Conway's figures would seem to be very nearly right.



HERRING BONE TAPPING OF "HEVEA,"  
IN SOUTH AMERICA.

At the same time no two estates are alike in yield. Trees vary not only in size but in productiveness. Trees that have been tapped for years give somewhat less than those that have only been tapped for a short time. In addition to this some gatherers tap every day, some every other day, some when they please, and few keep records that are at all reliable. There are occasional tales of unusual yields like the following: A man in Manáos in whom I have every confidence told me of a huge *Hevea* tree on the Madeira that gave 190 quarts of latex in one year. I don't know how thick the latex was, but that would normally mean something like 150 pounds of rubber. Which to say the least would be unusual.

In justice to the poor rubber gatherer who is considered careless and dishonest as a rule, I found many that were careful of the trees. For example, they did not cut into the wood of the tree at all. They were aware that a borer beetle, the *punilha*, is likely to attack the exposed wood and destroy the tree. For this reason some refused to pick the *sernamby* from the cuts, leaving it as nature's protection against disease and insects.

The *pelles* of fine Pará are usually of a size to be conveniently



BUNGALOW ON THE LOWER AMAZON.

handled in smoking and for ease in packing. They weigh from 10 to 100 pounds. Occasionally, however, big balls are made to order that are afterward exhibited as curios. For example, in 1897 two



HUT OF A "SERINGUEIRO" NEAR PARA.



huge balls were made for a New York importer. One weighed 864 pounds, the other 1279 pounds. It took something like 2500 pounds of milk to make the larger ball. In 1909 a rubber gatherer and his



SOUTH AMERICAN INDIAN WITH BLOW GUN AND ARROWS, SKETCHED BY LIEUTENANT GIBBON, U. S. N. 1851.

two sons made a ball that weighed 1118 pounds. They worked five months upon it, and brought it down to Manáos in a boat by itself, taking 25 days for the journey.



INDIANS OF THE RIO NEGRO.

The method by which export taxes are assessed in Pará and Manáos is very interesting. These duties are all *ad valorem* and are calculated not on individual shipments but by official (weekly) valuation. The office of state taxes, the *recebedoria*, receives every Monday morning reports from the exporters of the different prices at which they purchased the week preceding. These prices are averaged and the official price, the *pauta*, is at once declared for that current week, being that average.

This system applies to fine, coarse, and caucho, and has been in vogue almost from the beginning of rubber export.

## CHAPTER XXIV.

GOOD-BYE TO PARÁ—WONDERFUL PHOSPHORESCENCE—IN THE GREAT COAST CURRENT—SHORT STOP AT BARBADOS—LANDING RUBBER CARGO AT BROOKLYN.

THE time came when I must say farewell to the fair city of Pará and the warm hearted and hospitable Brazilians. I spent the last night at the home of a Brazilian friend; then, the next morning, starting early, went to the steamship office, where a score of friends had gathered to say good-bye. A little later, boarding a launch, I reached my steamer and we were soon en route for Barbados.

It was then that I met the Peruvian physician, of whom I have spoken, who was ill of *beriberi* and was seeking the salt water, which is said to be a sure cure. He scouted the generally accepted theory that the disease comes from eating polished rice, declaring that no one as yet had any idea of its cause.

In case any reader needs the services of this very skilful physician in Iquitos, his charges are 3 arrobas\* of rubber for an ordinary prescription and 25 arrobas for an operation, 10 per cent. to be added for shrinkage of the rubber.

The Peruvian doctor, by the way, told me of a young American in Pará, who bought a motor car called the "Reo." He was proud of it and proud of the name Reo, that appeared in gilt letters on the radiator. He also speeded the machine very rapidly. The courtly Brazilians named him "The Reo," some in all honesty and others with a smile of appreciation. He was much flattered until, one day, in brushing up his Portuguese, he discovered that the word meant "Criminal."

As we passed down the Tocantins the Captain pointed out a dozen places with broad, sandy beaches in a fairly high land, that were constantly cooled by the trade winds, where in his judgment Pará should have been located.

By 4 that afternoon only one shore was in sight. The water was turning from a muddy yellow to a tawny green and the ocean

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\*One arroba equals about 32 1/3 pounds in Brazil.



CANOE HABROR, PARA.



RUBBER IN CASES ON BROOKLYN DOCK.

(The long cases contain fine Pará rubber just removed  
from the steamer beyond.)

swell began to be felt. We left the mouth of the river just at sunset and two hours later were fascinated by the wonderful spectacle of a tropical phosphorescent sea. As the boat plowed through the water, broad streamers of star sparkles undulated on each side and trailed for hundreds of yards astern. Every breaking wave to the far horizon was an island of white fire. So bright were these myriad lights that we had difficulty in recognizing Salinas light, and were only sure of it by its yellow color. Soon we picked up the pilot boat and watched with



BOAT LANDING, PARA.

interest the half-hour struggle of the man in her little tender to get alongside and take off our pilot. Finally, by making a long jump, he landed sprawling in the boat; then we turned in and slept soundly.

The next day we found the great current that sweeps northward up the coast of South America, and which all navigators seek in going north but avoid in going south. The day was clear and bright, with a strong breeze on our quarter. The big freighter, almost flat bottomed, with no bilge keels, wallowed and rolled incessantly but pushed steadily



WEIGHING RUBBER AT BROOKLYN.

(The empty case is being weighed, the rubber appears in a pile in the foreground.)



CRUDE RUBBER SAMPLE ROOM IN IMPORTER'S OFFICE, AMSTERDAM.

forward. Fresh from the smooth waters of the Amazon and somewhat enervated by the heat, captain, officers, crew and passengers were all qualmish and sometimes frankly sick. Salines and fruit salts were abundantly in evidence. In 24 hours, however, all had recovered and were very proud that our ancient ark has made 237 miles. The next day it was 281, and the day following exactly the same. Directly after that we were being interviewed by a brisk, young physician in the roadstead off Bridgetown, Barbados; were given a clean bill of health, not



THE LAST OF THE CITY SUBURBS, PARÁ.

even being put under observation, and our \$50 deposit given back to us. Then we got in the "Lilywhite," were rowed ashore, and the tropical part of the (Brazilian) journey was finished.

Then followed the run to New York, to the rubber docks, for it was a rubber boat that I was on, and a view of the handling of the precious commodity as it was landed. The rubber is packed in wooden boxes, a case of fine Pará weighing 395 pounds, while one of coarse in a larger case will weigh about 700 pounds. Caucho, on the other hand, is shipped in all sorts of odd sized packages. The Pará





"PELLES" OF PARA RUBBER IN THE STOREHOUSE.

cases are usually strapped and are very carefully stowed and cared for from the time they leave Brazil. On their arrival in New York, for example, the discharging begins at once, the amount for each con-



GREAT RUBBER STOREHOUSES, ST. KATHERINE'S DOCK, LONDON.

signée being placed by itself. After the whole cargo has been unloaded, the cases are weighed with the rubber in them. The rubber is then carefully unpacked and the case weighed. It is then repacked and delivered to the consignee.

No one knows better than the quiet, skillful stevedores the value of the product they handle. The bartenders at the nearby saloons are also aware of its value and are perfectly willing to accept it as legal tender in exchange for drinks. In spite of the vigilant watch of those

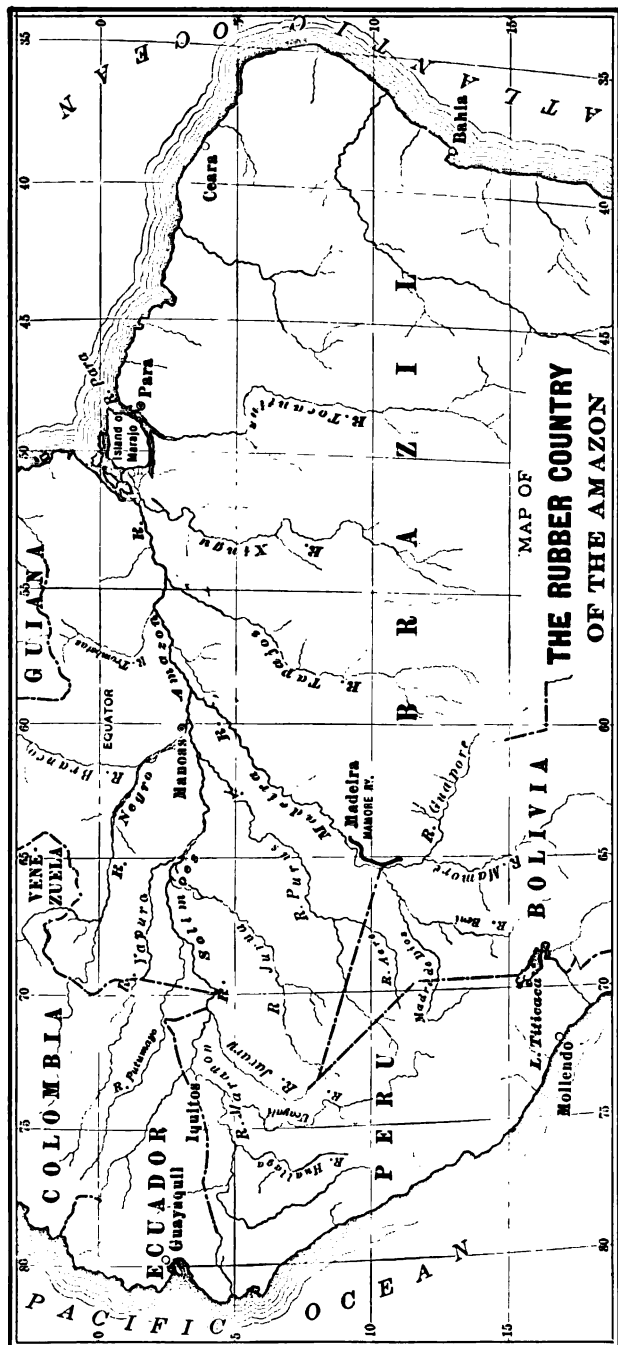


INTERIOR OF STORAGE VAULTS IN RUBBER WAREHOUSES, ST. KATHERINE'S DOCK, LONDON.

interested, considerable rubber is lost on the dock or in transit to the warehouses of the consignee. The thief may be detected or he may not. The fact that he has the rubber in his possession is not proof that it was stolen. The *pelles* look so much alike that it is often impossible to establish title to them.

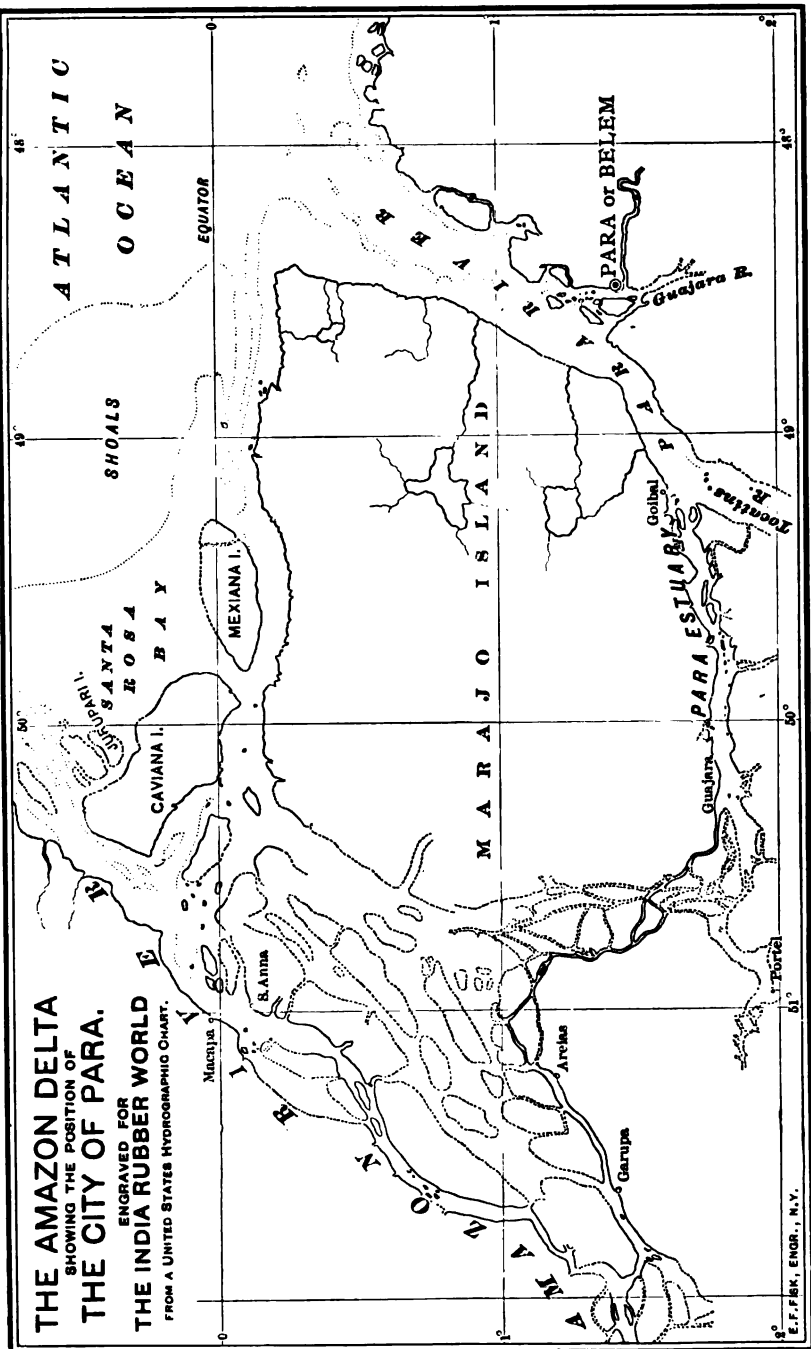
The value of the rubber cargoes is very great. In a single month four steamers discharged at the Brooklyn docks 2,000,000 pounds of rubber each, worth, at market price at that time, considerably more than \$10,000,000.





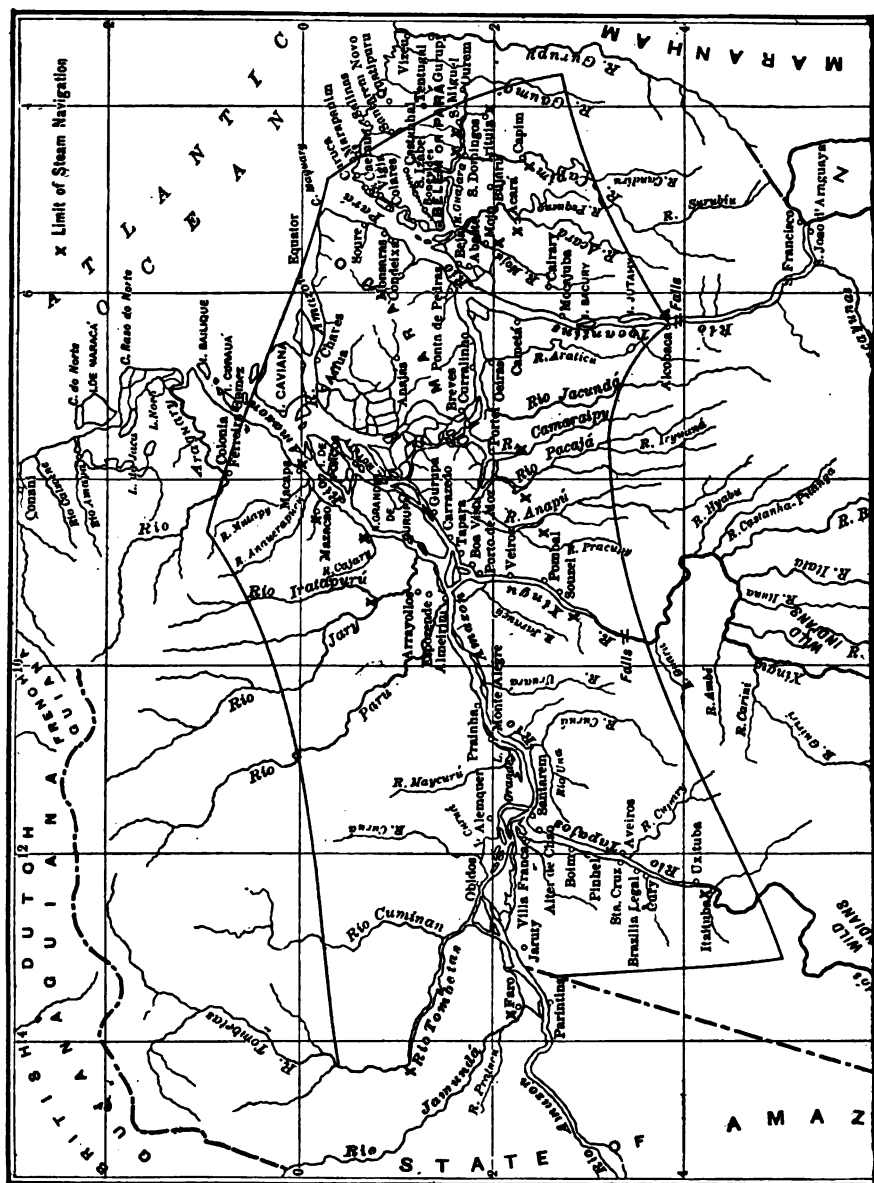


**THE AMAZON DELTA**  
 SHOWING THE POSITION OF  
**THE CITY OF PARA.**  
 ENGRAVED FOR  
 THE INDIA RUBBER WORLD  
 FROM A UNITED STATES HYDROGRAPHIC CHART.



E. F. FISK, ENGR., N. Y.

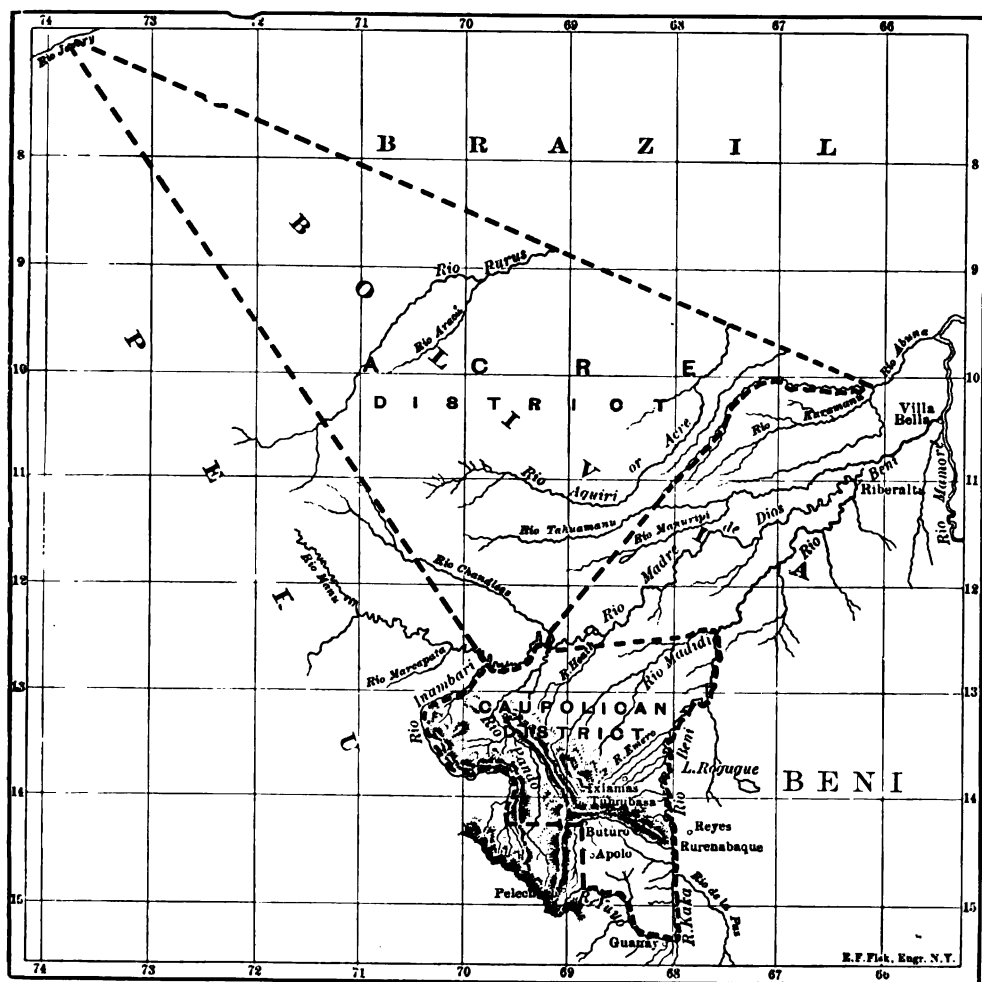




THE RUBBER PRODUCING REGION OF THE AMAZON.







**THE FEDERAL TERRITORY OF THE ACRE, IN BRAZIL.**

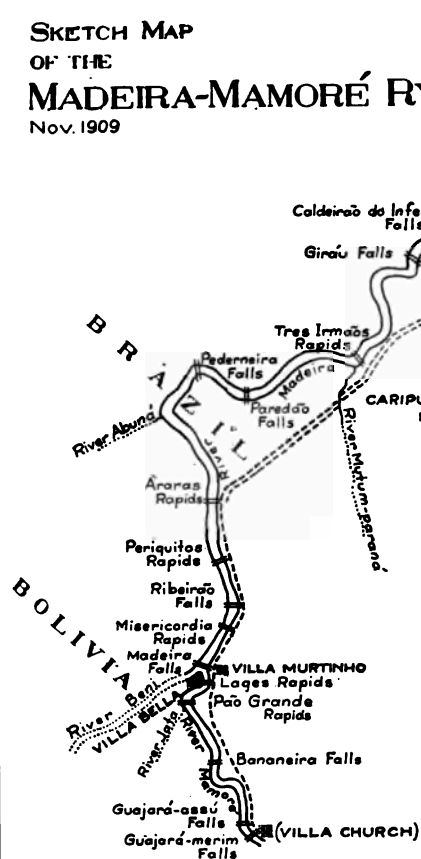


# SKETCH MAP

OF THE

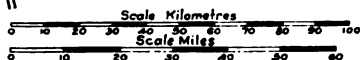
# MADEIRA-MAMORÉ RY.

Nov. 1909



## LEGEND

- Railroad Constructed (1 metre gauge)
- Construction in Progress
- Location Surveys in Progress
- Probable Route of Location
- Falls of the Madeira River



KEY MAP



## APPENDIX A

I WISH to express my thanks to Dr. João Antonio Luiz Coelho, Governor of the State of Pará, and to Colonel Antonio Clementé Bittencourt, Governor of the State of Amazonas, for their personal assistance, and for that of other officials which made my trip through the Amazonian rubber country so fruitful. The hospitality and helpfulness of the Manaós Commercial Association, and of the Brazilian, German, English, and American business men was of untold value, and I take pleasure in acknowledging my appreciation.

## APPENDIX B

### EXPORTS OF RUBBER FROM THE AMAZON VALLEY.

THE figures which follow relate to the quantity of rubber shipped, by years, from 1836 to 1909, inclusive. Prior to 1836, say for ten years, considerable rubber was exported, but the records are fragmentary and unreliable. The figures have been compiled from the records at Pará, covering the whole output of the Amazon and its tributaries. Succeeding tables give details of exports from Bolivia and Peru, which figures are embraced in the total in the first table. The statistics of caucho, beginning with 1888, are in addition to the output in each year of Pará rubber.

#### PARA RUBBER.

Years.	Pounds.	Years.	Pounds.
1836 .....	416,295	1862 .....	7,381,836
1837 .....	624,624	1863 .....	9,676,678
1838 .....	535,986	1864 .....	7,624,881
1839 .....	861,894	1865 .....	7,800,870
1840 .....	854,172	1866 .....	11,957,198
1841 .....	746,328	1867 .....	12,818,964
1842 .....	594,792	1868 .....	12,432,761
1843 .....	748,473	1869 .....	12,926,509
1844 .....	992,673	1870 .....	14,523,577
1845 .....	1,235,223	1871 .....	14,883,866
1846 .....	1,482,195	1872 .....	18,078,570
1847 .....	1,374,318	1873 .....	19,341,005
1848 .....	1,982,475	1874 .....	16,974,408
1849 .....	2,152,392	1875 .....	17,005,972
1850 .....	3,226,410	1876 .....	17,400,148
1851 .....	3,480,510	1877 .....	20,273,825
1852 .....	3,592,446	1878 .....	20,302,871
1853 .....	5,207,092	1879 .....	22,300,117
1854 .....	5,974,320	1880 .....	19,694,691
1855 .....	4,833,279	1881 .....	19,145,552
1856 .....	4,192,584	1882 .....	22,159,542
1857 .....	3,979,173	1883 .....	17,202,766
1858 .....	3,839,682	1884 .....	24,657,600
1859 .....	5,883,108	1885 .....	25,920,400
1860 .....	5,879,478	1886 .....	27,918,000
1861 .....	5,532,186	1887 .....	29,458,000

## PARA RUBBER—CONTINUED—AND CAUCHO.

Years.	Pará.	Caucho.
1888 .....	30,701,350 .....	2,323,116
1889 .....	33,094,083 .....	1,863,031
1890 .....	33,947,463 .....	2,121,363
1891 .....	36,654,101 .....	2,482,590
1892 .....	37,738,681 .....	2,981,132
1893 .....	39,473,626 .....	2,612,812
1894 .....	39,940,822 .....	2,901,292
1895 .....	42,092,752 .....	3,600,326
1896 .....	43,697,417 .....	3,826,706
1897 .....	45,019,282 .....	4,560,627
1898 .....	43,877,636 .....	4,322,179
1899 .....	50,368,083 .....	5,577,937
1900 .....	52,793,538 .....	6,053,520
1901 .....	57,918,540 .....	8,720,556
1902 .....	55,790,687 .....	7,018,829
1903 .....	59,145,050 .....	9,263,822
1904 .....	57,640,396 .....	9,776,704
1905 .....	60,403,160 .....	13,223,994
1906 .....	62,560,813 .....	13,928,248
1907 .....	66,789,166 .....	15,741,968
1908 .....	67,389,821 .....	16,349,551
1909 .....	68,522,657 .....	18,272,190
1910 .....	36,999,965 .....	12,940,767

## TOTAL EXPORTS OF BOLIVIAN RUBBER.

[Pará, including a little Cauchó.]

Years.	Pounds.	Years.	Pounds.
1890 .....	646,800	1900 .....	7,691,728
1891 .....	759,000	1901 .....	7,623,138
1892 .....	799,480	1902 .....	4,186,585
1893 .....	868,600	1903 .....	2,906,274
1894 .....	1,391,500	1904 .....	3,456,481
1895 .....	1,804,902	1905 .....	3,720,908
1896 .....	2,509,566	1906 .....	4,245,138
1897 .....	3,683,295	1907 .....	3,606,664
1898 .....	6,943,100	1908 .....	4,027,128
1899 .....	4,708,000	1909 .....	6,715,399

## PERUVIAN RUBBER (PARA AND CAUCHO) SHIPPED FROM IQUITOS.

Years.	Pounds.	Years.	Pounds.
1900 .....	2,019,851	1905 .....	5,166,110
1901 .....	2,552,686	1906 .....	5,747,625
1902 .....	3,104,114	1907 .....	6,903,237
1903 .....	4,528,625	1908 .....	6,781,573
1904 .....	4,017,193	1909 .....	6,086,375



## APPENDIX C

### SHRINKAGE OF RUBBER.

**C**RUDE stock of nearly all kinds is measured by certain standards that are absolute. The price paid depends entirely upon purity as compared with the fixed standard. Sugar, for example, is carefully tested by the polariscope, and the price paid for it depends upon the amount of the saccharine matter found.

There is no standard for crude rubber. The highest grade of rubber, old dry Fine Pará, is not a standard, for no one knows what the shrinkage will be. With new crop rubber it is the same. The shrinkage may be one figure, or it may be 10 per cent. more. There is first the shrinkage *en route* or in store, which is considerable, through the water drying out. Then there is the greater shrinkage when the moisture, the carbon from the smoke, and other foreign substances have been thoroughly removed by washing in the factory.

Pará shrinkages, from Bolivian to Islands, vary about as follows: Fine, 15 to 20 per cent.; medium, 16 to 22 per cent.; coarse, 20 to 33 per cent. This in a measure, is why Pará and Manaós statistics do not jibe with New York and Liverpool figures, for example.

Various grades of Pará and Caucho rubber, showing percentage of shrinkages:

Class.	Fine.	Medium.	Coarse.
Upriver .....	16-18	17-19	18-25
Peruvian .....	15-17	16-18	20-25
Bolivian .....	15-17	16-18	20-25
Mollendo .....	15-17	16-18	—
Madeira .....	15-18	16-19	20-25
Manáos .....	16-17	17-18	18-22
Angostura .....	16-18	17-19	25-30
Matto Grosso .....	16-18	17-19	18-25
Islands .....	18-20	18-22	25-35
Caviana .....	16-18	18-20	25-30
Itaituba .....	17-18	18-19	20-25
Cameta .....	—	—	30-35
Caucho balls .....			25-35
Caucho slabs or strips .....			35-42

### RUBBER SELLING CONDITIONS.

Crude rubber is sold to the manufacturer in the main about as follows:

1. The seller draws up, signs, and sends a contract to the buyer, stating conditions of sale. Silence on the part of the buyer is acceptance of contract.
2. Any change must be made 10 days from the dating of the contract.

3. The rubber becomes purchaser's property as soon as it leaves the seller's hands, the buyer paying the freight.

4. Stealing *en route* is the buyer's loss.

5. If the shipment is questioned as to quality, if bought by sample, that is compared. If not up to sample, seller must replace the lot with what he agreed to deliver.

6. The buyer is not allowed to select the good and reject the bad of any lot. He must take all or none.

7. If the seller fails to make deliveries on or before the last week day of the month specified, the buyer can enter the open market and purchase, charging the loss to the seller. This, however, is very rarely done.

Rubber is purchased by the manufacturer by samples, the price depending not only upon the grade, but also upon its dryness and cleanliness. Years ago, when it took many months to get fine Pará into the market, the water had dried out of it, so that "old fine" meant a comparatively dry rubber.

To-day with the much quicker transportation and the immediate use to which rubber is put, most of the grades contain much more moisture.

#### PRICES AND SPECULATIONS.

Average Monthly and Yearly Prices of New Upriver Fine Pará Rubber for Eleven Years.

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Jan. ....	\$1.09	\$ .90	\$ .81	\$ .89	\$ .99	\$1.22	\$1.26	\$1.22	\$ .78	\$1.21	\$1.82
Feb. ....	1.07	.87	.75	.87	1.04	1.27	1.27	1.21	.71	1.23	1.98
Mar. ....	1.12	.85	.74	.91	1.09	1.31	1.27	1.18	.76	1.24	2.33
April ....	1.00	.89	.73	.91	1.09	1.32	1.26	1.16	.81	1.23	2.75
May ....	.96	.91	.73	.92	1.13	1.33	1.25	1.14	.88	1.30	2.57
June ....	.93	.88	.71	.91	1.12	1.32	1.24	1.10	.91	1.43	2.34
July ....	.95	.86	.71	.95	1.15	1.29	1.23	1.12	.93	1.72	2.23
August ...	.96	.88	.73	.97	1.19	1.28	1.23	1.11	.93	1.87	2.03
Sept. ....	1.01	.89	.76	1.05	1.15	1.30	1.23	1.08	.99	1.52	1.73
Oct. ....	.97	.87	.77	1.04	1.15	1.25	1.23	1.02	1.08	2.08	1.43
Nov. ....	.86	.85	.80	.97	1.23	1.23	1.23	.99	1.21	1.98	1.44
Dec. ....	.93	.86	.85	.95	1.24	1.26	1.23	.84	1.19	1.89	1.43
Average annual }	\$ .99	\$ .87½	\$ .75½	\$ .94½	\$1.13	\$1.28	\$1.24½	\$1.09½	\$ .93	\$1.56	\$2.01

The existence of speculation in crude rubber is both affirmed and denied by those interested. In the Amazon country when rubber is low the producers claim that speculators are at work. The higher it goes the more they talk of the law of supply and demand. Normally the price of rubber is fixed by whatever city, Brazilian, European or American, that may have the largest stock of fine Pará. Among manufacturers, whenever the price of rubber goes up it is laid to speculation, and when it goes down they talk about the law of supply and demand. Nevertheless the whole business is speculative. There is no absolute standard as to grade. No one can forecast what a crop season will produce. The manufacturers are unable to say what they will need a year ahead. Add to this, with a rate of exchange constantly changing, how can anybody help doing some speculating?

Most large manufacturers buy for future delivery, in itself a speculation, but a wise one.

Such a valuable product as Pará rubber would naturally attract the attention of big speculators, and "corners" would be attempted. A brilliant Brazilian Baron, beginning in 1882, almost cornered Pará rubber four different times, and in doing this succeeded in forcing the price up to figures then thought prohibitive. An American importing company also came very near effecting a corner on rubber—in fact, did so until the banks got tired of carrying stocks; then prices dropped very suddenly.

A line of speculation followed in the past by strong outside interests was the securing of large quantities of rubber from the producers at exceedingly low figures, when a marked rise in the market was not only in sight but practically assured. This "bearing" of the market by outside interests has been taken in hand by the Brazilian government. Branches of the *Banco do Brasil* have been established on the Amazon. These banks are authorized to make substantial advances on rubber in the hands of Brazilian producers, which means that the rubber may be held until what is deemed a fair price be offered for it. In other words, this is an adaption of the "valorization" plan that Brazil put in force to keep the price of coffee where she believed it belonged.

Baron de Gondoriz who once, nay four times nearly cornered Pará rubber, thus arraigned the United States for her awkward commercial arrangements with Brazil. Although written long ago it is pertinent to-day.

"If North America really desires more reciprocal trade relations with Brazil they might be secured through the agency of a carefully managed bank at Pará based on American capital. The value of the business done here monthly is more than \$2,500,000, all through English banking houses, which make their money on this large exchange. Two and a half millions are paid each month for the natural products of the Amazon valley, two thirds of which go to the United States. The rubber men of the United States pay gold coin through English banks for crude rubber, and the rubber producer here pays the producer in merchandise making room for a heavy profit, by the way. The business in exchange is so great that it is said that there is a broker for each firm in trade, the fluctuations in the price of exchange being something which the uninitiated find it hard to comprehend. Usually when a foreigner's occupation is gone as a manager or banker, he does not leave the company which he has severely condemned, but he becomes a 'broker' and continues to live among the same objectionable people."

## APPENDIX D

THE following is a fairly complete list of latex producing trees in the Amazon basin of the three important classes—*Hevea*, *Sapium* and *Mimusops*. The two latter are not rubber producers at present chiefly because they are not tapped. Most of the rubber comes from the *Hevea* sorts, the *Brasiliensis* particularly, which furnishes the Pará grade, and the *Castilloas Ulei*, from which comes caucho.

### SPECIES OF "HEVEA."

Name.	Botanist.	Name.	Botanist.
<i>Hevea Guyanensis</i> .....	Aublet.	<i>H. Randiana</i> .....	Huber.
<i>H. nigra</i> .....	Ule.	<i>H. Brasiliensis</i> .....	Muel. Arg.
<i>H. lutea</i> .....	Muel. Arg.	<i>H. Spruceana</i> .....	Muel. Arg.
<i>H. apiculata</i> .....	Muel. Arg.	<i>H. similis</i> .....	Hemsley
<i>H. cuneata</i> .....	Huber.	<i>H. discolor</i> .....	Muel. Arg.
<i>H. Benthiana</i> .....	Muel. Arg.	<i>H. pauciflora</i> .....	Muel. Arg.
<i>H. Duckei</i> .....	Huber	<i>H. confusa</i> .....	Hemsley.
<i>H. paludosa</i> .....	Ule.	<i>H. nitida</i> .....	Muel. Arg.
<i>H. rigidifolia</i> .....	Muel. Arg.	<i>H. viridis</i> .....	Huber.
<i>H. minor</i> .....	Hemsley.	<i>H. Kunthiana</i> .....	Huber.
<i>H. microphylla</i> .....	Ule.		

### SPECIES OF "CASTILLOA."

*Castilloa Ulei*.....Warburg.

### SPECIES OF "SAPIUM."

<i>Sapium Marmieri</i> .....	Huber.
<i>S. aereum</i> .....	Muel. Arg.
<i>S. Pavonianum</i> .....	Huber.
<i>S. Poeppigii</i> .....	Hemsley.
<i>S. stenophyllum</i> .....	Huber.
<i>S. tapuru</i> .....	Ule.
<i>S. lanceolatum</i> .....	Muel. Arg.

### SPECIES OF BALATA.

<i>Mimusops densiflora</i> .....	Huber.
<i>M. amazonica</i> .....	Huber.
<i>M. elata</i> .....	Freire.
<i>M. Amazonica</i> .....	Huber.
<i>M. Paraensis</i> .....	Freire.
<i>M. discolor</i> .....	Freire.

## APPENDIX E

IT will be news to most, but in 1850 Pará had a big rubber shoe factory of its own. It came about in this way. The city of Salem, Massachusetts, back in the '40's was most enterprising in fitting out trading vessels that went to all parts of the world. One of the best known captains brought to the "city of witches" a pair of pure gum unvulcanized rubber shoes on clay lasts. Some bright Yankee saw that they could be made to take place of wool socks and moccasins and imported several pairs which sold readily. The business increasing, a Salem house established a rubber shoe factory in Pará. Their shoes were known under the name of *Fabrica* and sold all over the world, retailing at 50 cents to \$1.25 a pair.

These thick, awkward, ill shaped shoes, with their crude ornamentation may still be seen in museums. A few venerable shoe dealers also recollect their own part in preparing them for market. When a box of shoes was received from Pará, they were stored in a cool cellar to keep them away from heat. Then came the preparing them for sale. They were truned inside out, relieved of their stuffing of hay, thoroughly washed, and stretched over wooden lasts. Some had round toes, some pointed; some were thick, some thin; there were no rights and lefts. They were, however, paired up as well as possible, warmed and molded into shape; trimmed and varnished, and they found a ready sale.

They became very soft when heated and under the influence of cold grew rigid as iron. They drew the feet excruciatingly. But thousands of pairs were sold and there are those to-day of course who lament the passing of the pure rubber shoes.

Salem also imported rubber bottles about this same time, which bottles were cut up into strips for suspender webs. How large a business this was for a few years is on record in the Salem custom house, in the handwriting of Nathaniel Hawthorne, as follows:

Years.	Pounds.
1850-1851.....	43,000
1851-1852.....	1,969,000
1852-1853.....	1,407,000
1853-1854.....	2,056,000

After 1854 the business of importing rubber into Salem dropped off very rapidly, and ceased entirely in 1861.

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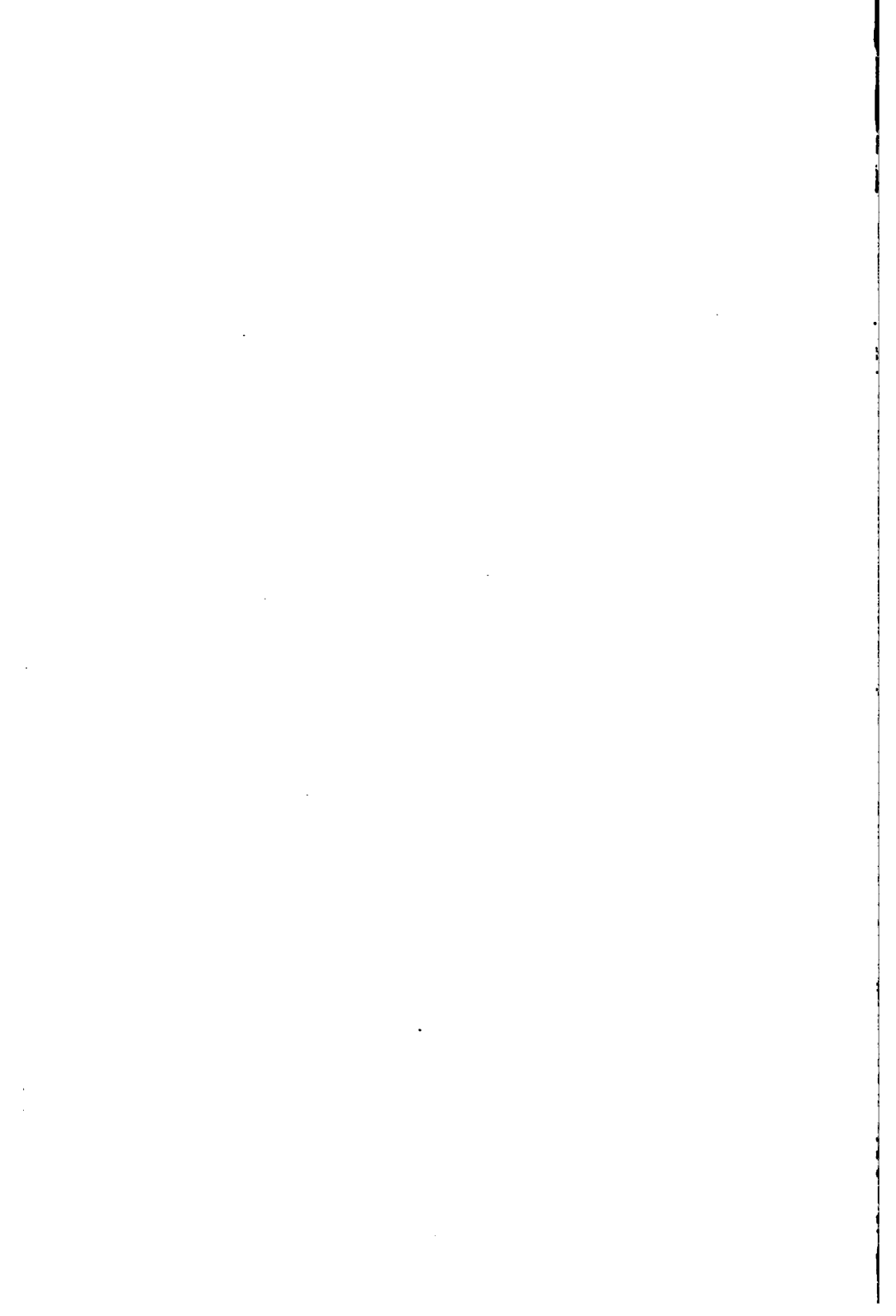
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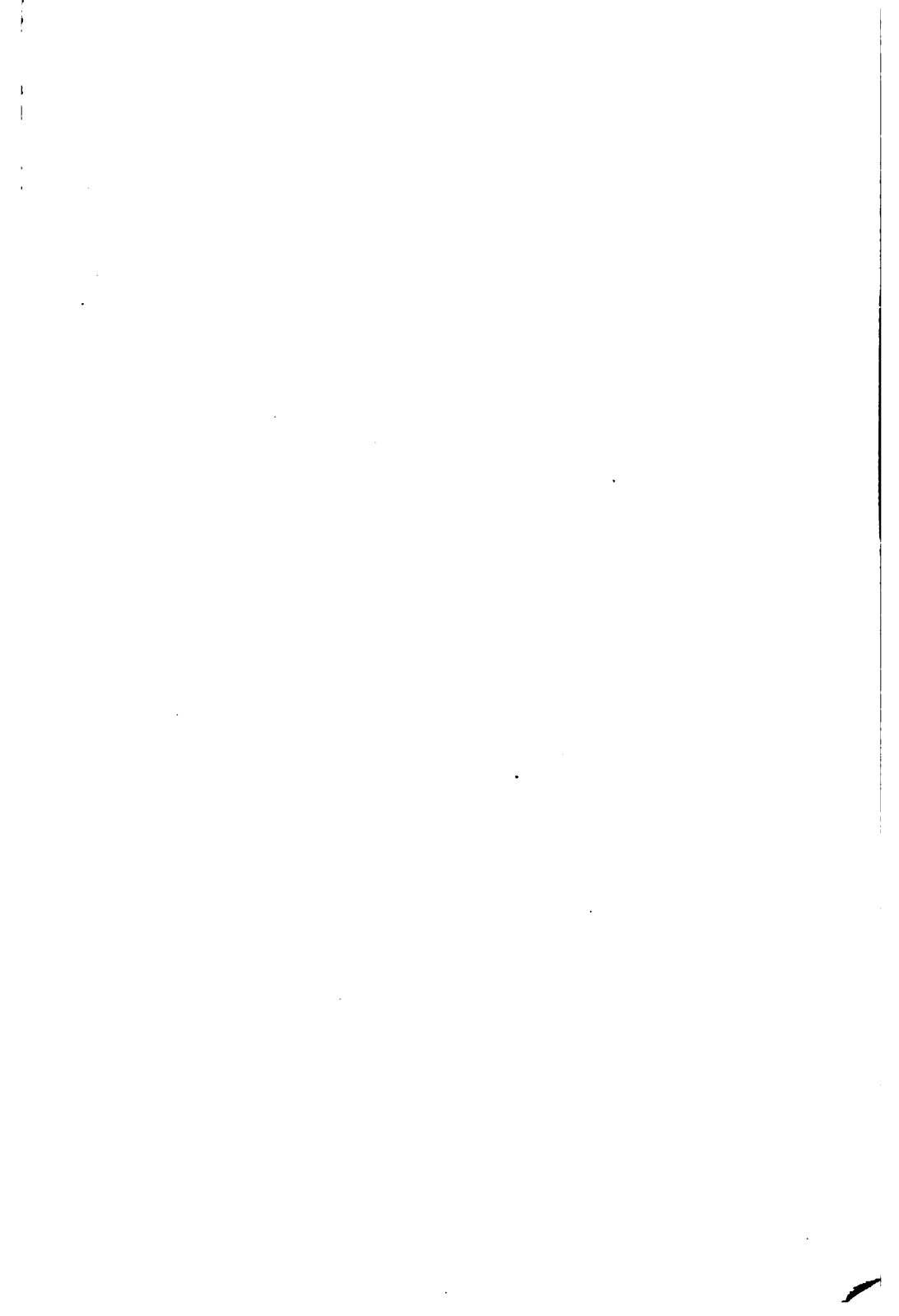












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